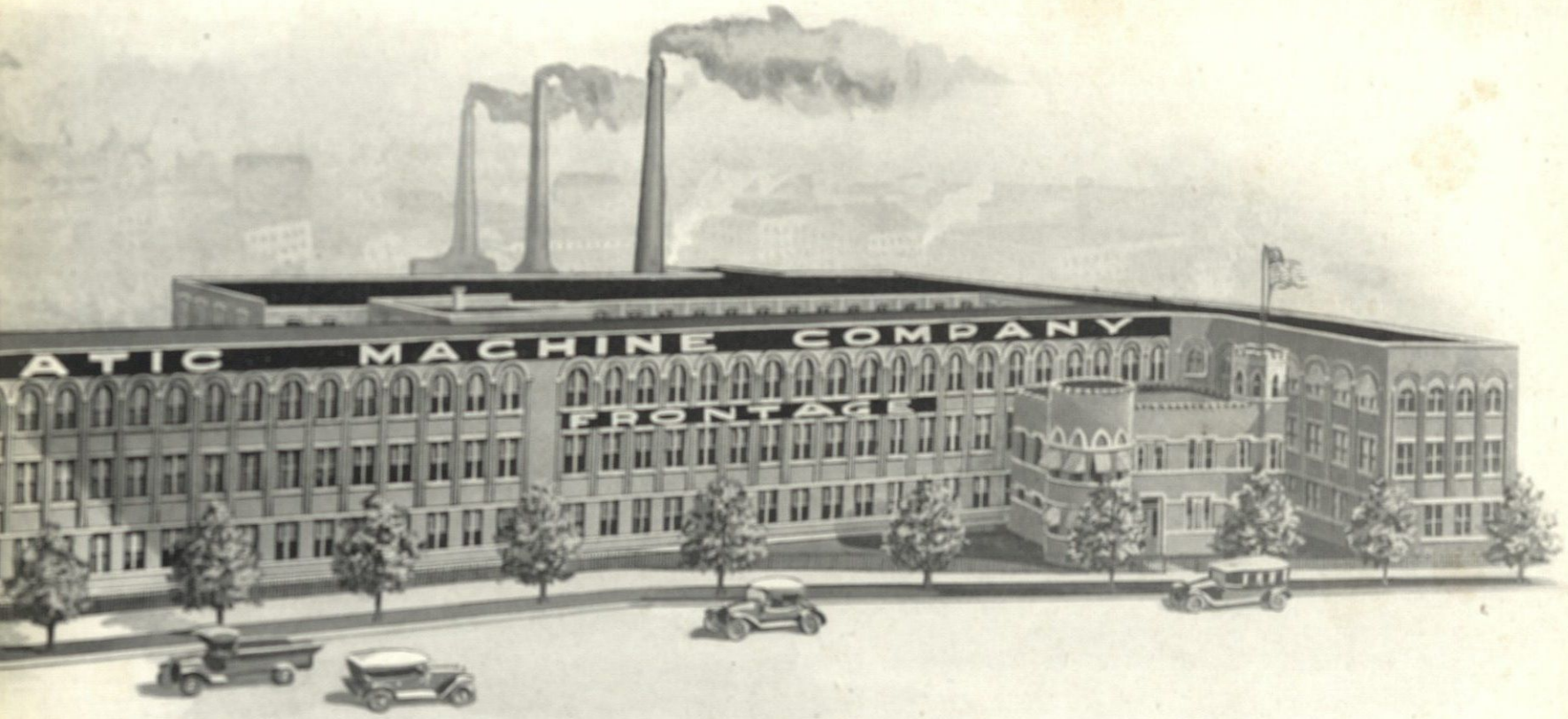
"Cleveland"

The "Cleveland"

THE CLEVELAND AUTO
720 FOOT


ATIC MACHINE COMPANY
FRONTAGE

CATALOGUE

—of—

The Cleveland Automatic Machine Company

—with—

Illustrations and Descriptions *of* Their Machines,
Attachments and Tools

CLEVELAND, OHIO, · U. S. A.

W. E. O'CONNOR AUG. 25/1906

Incomparable Range

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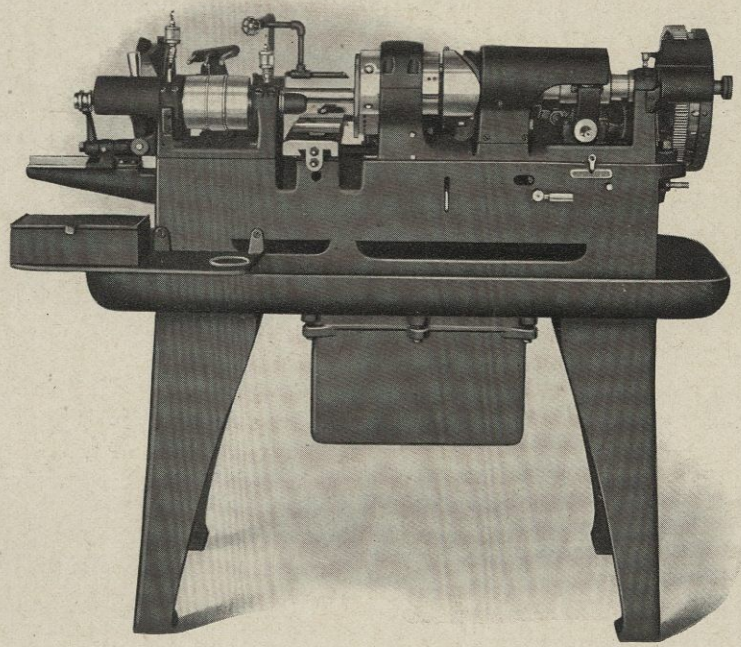


3/8 Inch Turret Full Automatic Machine—Model A

MODEL A

3/8 Inch Turret Full Automatic Machine

CODE—FABRIC

RANGE:

Chuck Capacity	3/8 in.
Length of Stock Feed	4 3/4 in.
Milling Length	2 1/4 in.
Longitudinal Adjustment of Turret Head on Bed	1 3/4 in.
Turret Face to Face of Chuck, Minimum	2 7/32 in.
Turret Face to Face of Chuck, Maximum	3 31/32 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	7/8 in.
Height from Center of Spindle to Top of Cross Slide	1 5/16 in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	980
Speeds, R. P. M., Maximum	5000

DRIVE:

Belt Widths, Spindle	1 in.
Belt Widths, Feed	1 in.
Motor Drive, H. P. Required	1 1/2
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10 x 2 1/8 in.
Speeds of Countershaft, R. P. M.	1010, 855, 735

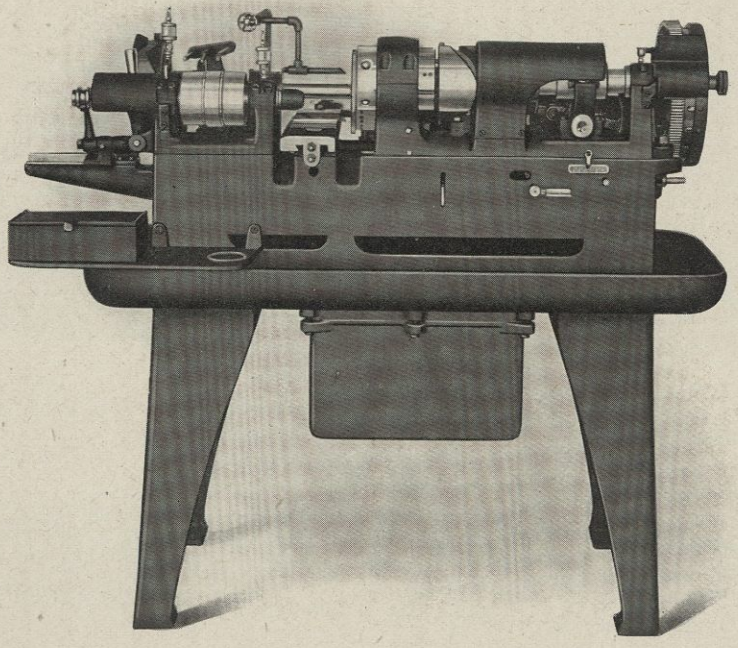
STANDARD ATTACHMENTS:	**Code**
Slotting and Slabbing with Machine	*Fabulous*
Thread Rolling	*Dothanny*
Independent Cut-off	*Mobileny*
High Speed Drilling, Counterboring and Reaming	*Gab*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cab*

FLOOR SPACE ..... 34x66 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	155 lbs.
Foreign Shipment—Box Weight	345 lbs.
Cubic Feet Boxed for Foreign Shipment	78.5
Net Weight of Machine with Countershaft	1305 lbs.

Both "CLEVELANDS" are perfectly safe investments—one good to live in and the other good to live on.



3/8-1/2 Inch Turret Full Automatic Machine—Model A

MODEL A

3/8—1/2 Inch Turret Full Automatic Machine

CODE—FABRICATE

RANGE:

Chuck Capacity	½ in.
Length of Stock Feed	4¾ in.
Milling Length	2¼ in.
Longitudinal Adjustment of Turret Head on Bed	1¾ in.
Turret Face to Face of Chuck Minimum	2 7/32 in.
Turret Face to Face of Chuck Maximum	3 31/32 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	⅞ in.
Height from Center of Spindle to Top of Cross Slide	1 5/16 in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M. Minimum	980
Speeds, R. P. M. Maximum	5000

DRIVE:

Belt Widths Spindle	1 in.
Belt Widths Feed	1 in.
Motor Drive, H. P. Required	1½
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.	1010, 855, 735

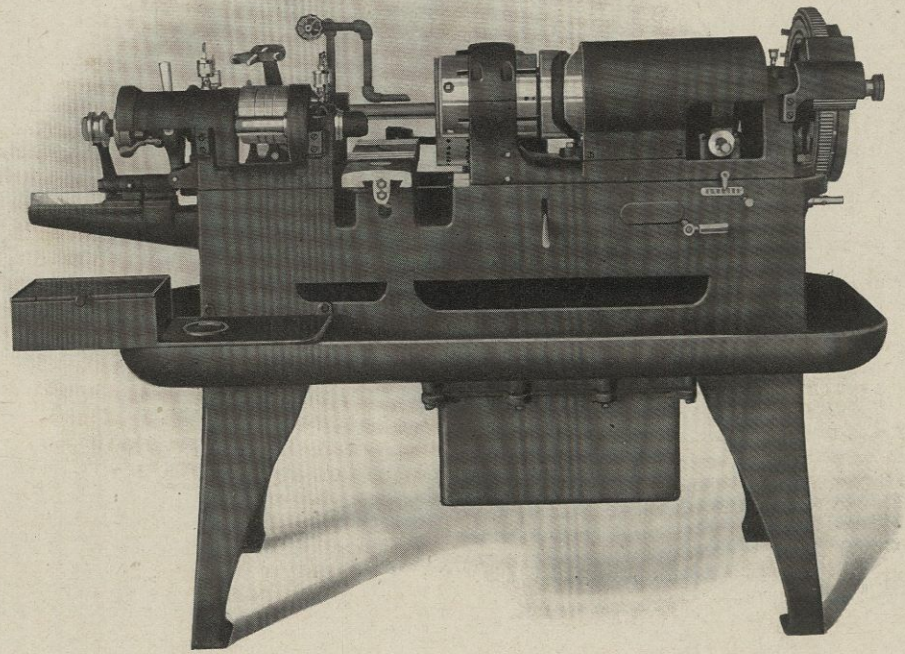
STANDARD ATTACHMENTS:	Code
Slotting and Slabbing with Machine	*Facade*
Thread Rolling	*Dothanill*
Independent Cut-off	*Mobileill*
High Speed Drilling, Counterboring and Reaming	*Gab*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cab*

FLOOR SPACE 34x66 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	155 lbs.
Foreign Shipment—Box Weight	345 lbs.
Cubic Feet Boxed for Foreign Shipment	78.5
Net Weight of Machine with Countershaft	1305 lbs.

If you are a good judge of a day's work, investigate the ability of a CLEVELAND.



5/8 Inch Turret Full Automatic Machine—Model A

MODEL A

5/8 Inch Turret Full Automatic Machine

CODE—FACE

RANGE:

Chuck Capacity	5/8 in.
Length of Stock Feed	6½ in.
Milling Length	3¾ in.
Longitudinal Adjustment of Turret Head on Bed	2½ in.
Turret Face to Face of Chuck, Minimum	3 3/16 in.
Turret Face to Face of Chuck, Maximum	5 11/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1 1/16 in.
Height from Center of Spindle to Top of Cross Slide	2¼ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	282
Speeds, R. P. M., Maximum	1243

DRIVE:

Belt Widths, Spindle	1½ in.
Belt Widths, Feed	1 in.
Motor Drive, H. P. Required	2
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.	533, 450, 385

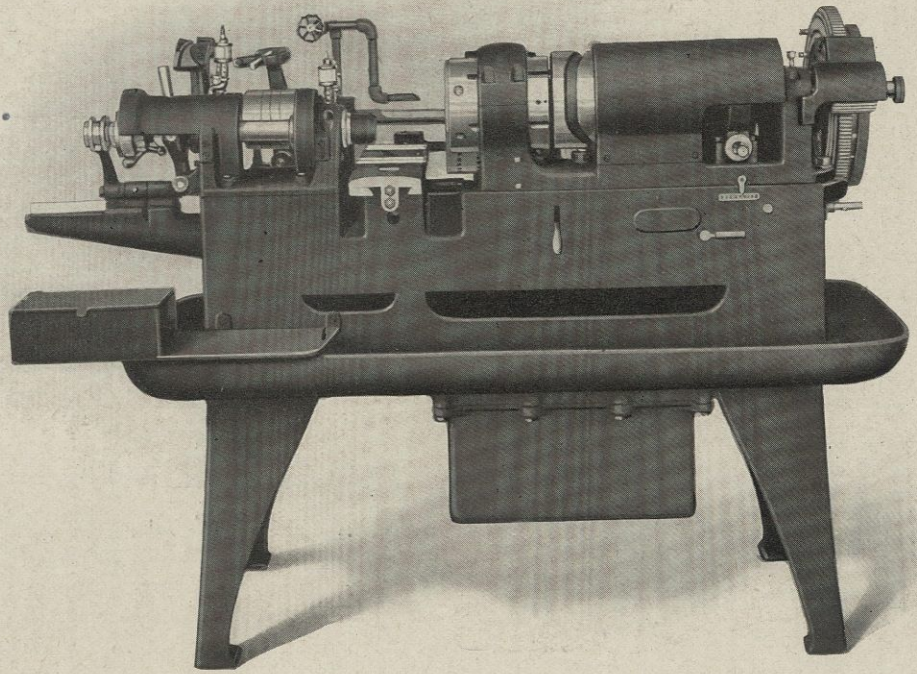
STANDARD ATTACHMENTS:	**Code**
Magazine (Rotary Tilting)	*Label*
Air Chucking	*Airmo*
Slotting and Slabbing (with Machine)	*Faculty*
Thread Rolling	*Dothanmo*
Independent Cut-off	*Mobilemo*
High Speed Drilling, Counterboring and Reaming	*Gaban*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabal*

FLOOR SPACE 45x88 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	270 lbs.
Foreign Shipment—Box Weight	500 lbs.
Cubic Feet Boxed for Foreign Shipment	126.3
Net Weight of Machine with Countershaft	2244 lbs.

The CLEVELAND'S record is 100% pure. We have been in existence for 25 years, and have hundreds of satisfied customers.



5/8-7/8 Inch Turret Full Automatic Machine—Model A

MODEL A

5/8—7/8 Inch Turret Full Automatic Machine

CODE—FACIAL

RANGE:

Chuck Capacity	7/8 in.
Length of Stock Feed	6½ in.
Milling Length	3¾ in.
Longitudinal Adjustment of Turret Head on Bed	2½ in.
Turret Face to Face of Chuck Minimum	3 3/16 in.
Turret Face to Face of Chuck Maximum	5 11/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1 1/16 in.
Height from Center of Spindle to Top of Cross Slide	2¼ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M. Minimum	282
Speeds, R. P. M. Maximum	1243

DRIVE:

Belt Widths Spindle	1½ in.
Belt Widths Feed	1 in.
Motor Drive, H. P. Required	2
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.	533, 450, 385

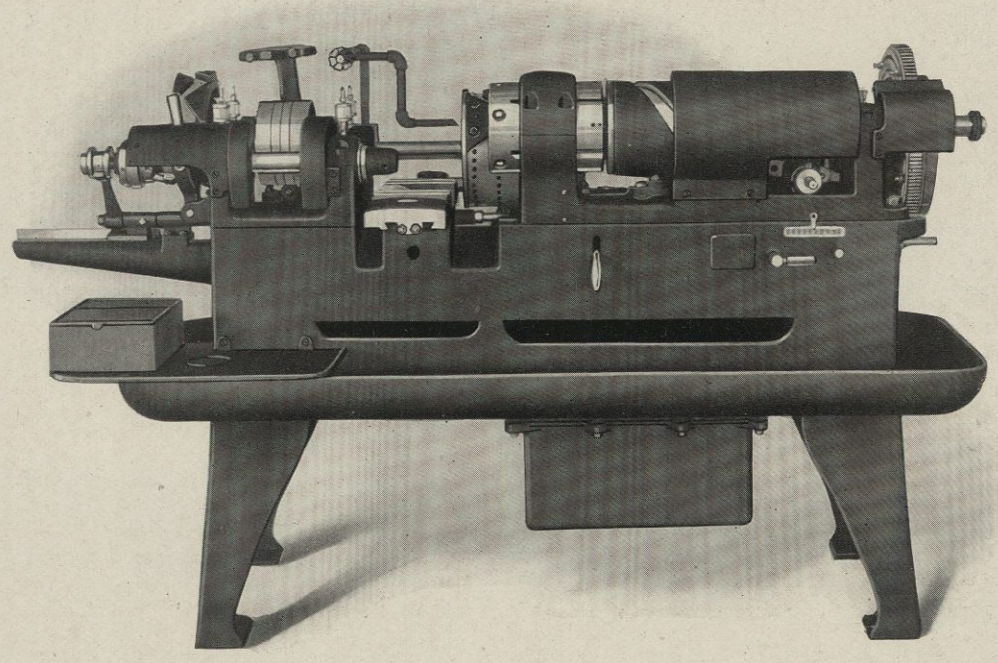
STANDARD ATTACHMENTS:	Code
Magazine (Rotary Tilting)	*Label*
Air Chucking	*Airohi*
Slotting and Slabbing (with Machine)	*Facient*
Thread Rolling	*Dothanohi*
Independent Cut-off	*Mobileohi*
High Speed Drilling, Counterboring and Reaming	*Gaban*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabal*

FLOOR SPACE 45x88 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	270 lbs.
Foreign Shipment—Box Weight	500 lbs.
Cubic Feet Boxed for Foreign Shipment	126.3
Net Weight of Machine with Countershaft	2289 lbs.

Properly assigning work according to each individual's ability is a thing to be seriously considered. The same applies to Automatics.



7/8 Inch Turret Full Automatic Machine—Model A

MODEL A

7/8 Inch Turret Full Automatic Machine

CODE—FACIES

RANGE:

Chuck Capacity	7/8 in.
Length of Stock Feed	8½ in.
Milling Length	4¾ in.
Longitudinal Adjustment of Turret Head on Bed	3½ in.
Turret Face to Face of Chuck—Minimum	4 1/16 in.
Turret Face to Face of Chuck—Maximum	7 9/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1¼ in.
Height from Center of Spindle to Top of Cross Slide	2⅜ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	241
Speeds, R. P. M.—Maximum	934

DRIVE:

Belt Widths—Spindle	1½ in.
Belt Widths—Feed	1 in.
Motor Drive, H. P. Required	2½
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.	533, 450, 385

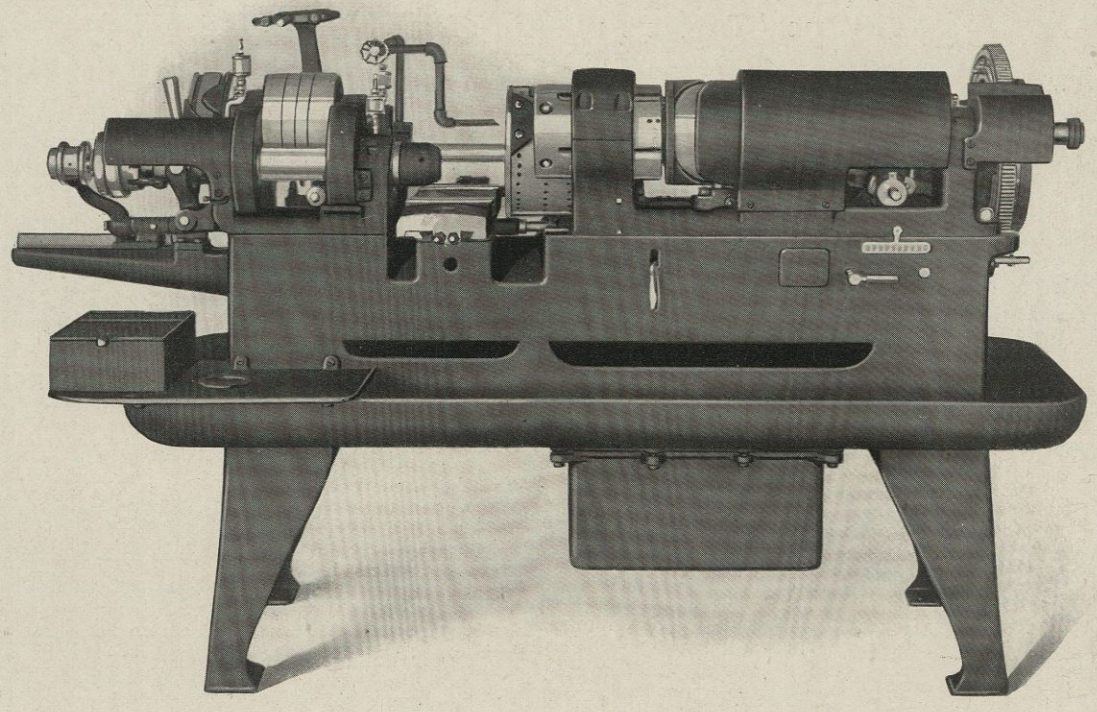
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Labile*
Air Chucking	*Airmd*
Slotting and Slabbing (with Machine)	*Facing*
Third Spindle Speed	*Oaken*
Thread Rolling	*Dothanmd*
Independent Cut-off	*Mobilemd*
High Speed Drilling, Counterboring and Reaming	*Gable*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabalist*
Overhanging Turret Turning	*Reveremd*

FLOOR SPACE 42x102 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	329 lbs.
Foreign Shipment—Box Weight	606 lbs.
Cubic Feet Boxed for Foreign Shipment	161.7
Net Weight of Machine with Countershaft	3391 lbs.

Staying qualities coupled with range—the all essential things of importance in the CLEVELAND.



⅞-1¼ Inch Turret Full Automatic Machine—Model A

MODEL A

7/8—1 1/4 Inch Turret Full Automatic Machine

CODE—FACTIK

RANGE:

Chuck Capacity	1¼	in.
Length of Stock Feed	8½	in.
Milling Length	4¾	in.
Longitudinal Adjustment of Turret Head on Bed	3½	in.
Turret Face to Face of Chuck—Minimum	3 7/16	in.
Turret Face to Face of Chuck—Maximum	6 15/16	in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5	
Diameter of Turret Holes	1¼	in.
Height from Center of Spindle to Top of Cross Slide	2⅜	in.

SPINDLE SPEEDS:

Number of Changes	6	
Speeds, R. P. M.—Minimum	152	
Speeds, R. P. M.—Maximum	725	

DRIVE:

Belt Widths—Spindle	2	in.
Belt Widths—Feed	1	in.
Motor Drive, H. P. Required	2½	
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛	in.
Speeds of Countershaft, R. P. M.	533, 450, 385	

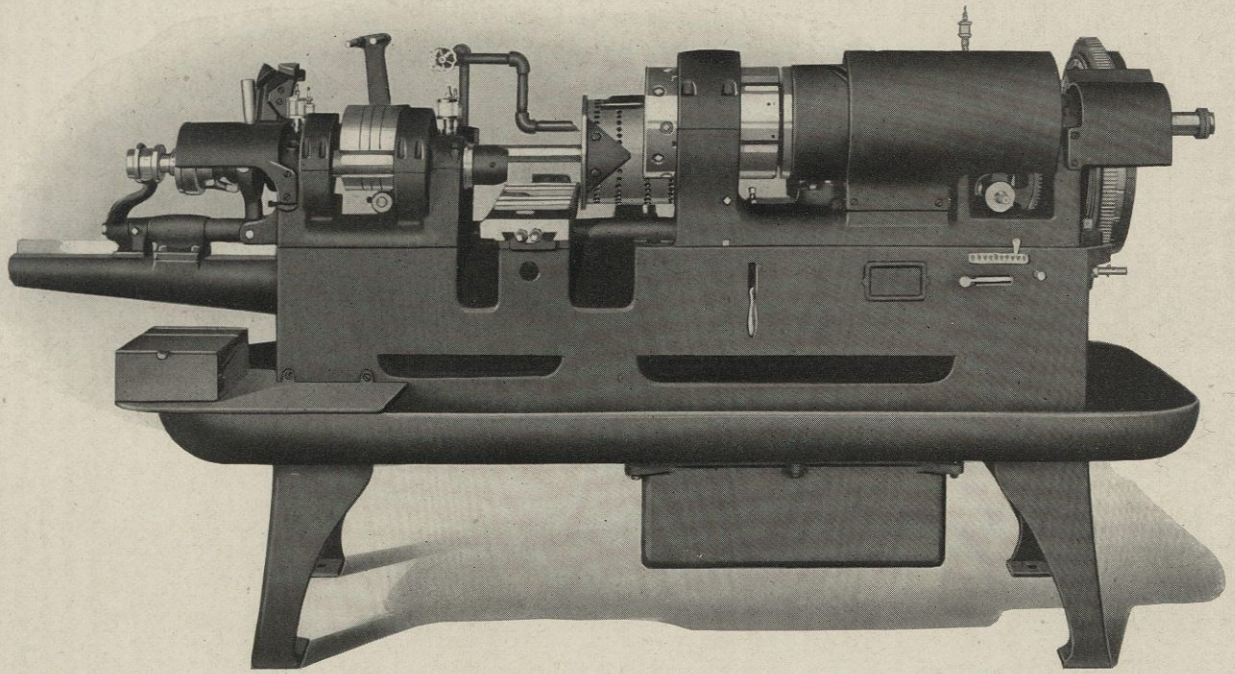
STANDARD ATTACHMENTS:	**Code**
Magazine (Rotary Tilting)	*Labile*
Air Chucking	*Airkan*
Slotting and Slabbing (with Machine)	*Factiker*
Third Spindle Speed	*Oakland*
Thread Rolling	*Dothankan*
Independent Cut-off	*Mobilekan*
High Speed Drilling, Counterboring and Reaming	*Gable*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabalist*
Overhanging Turret Turning	*Reverekan*

FLOOR SPACE 42x102 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	329 lbs.
Foreign Shipment—Box Weight	606 lbs.
Cubic Feet Boxed for Foreign Shipment	161.7
Net Weight of Machine with Countershaft	3438 lbs.

In producing anything, the cost is uppermost in the mind of the Manager, through competition and otherwise. Our product would help in such a case.



1¼ Inch Turret Full Automatic Machine—Model A

MODEL "A"

1 1/4 Inch Turret Full Automatic Machine

CODE—FACTION

RANGE:

Chuck Capacity		1¼ in.
Length of Stock Feed		10½ in.
Milling Length		6 in.
Longitudinal Adjustment of Turret Head on Bed		4 in.
Turret Face to Face of Chuck	Minimum	5 3/16 in.
	Maximum	9 3/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1½ in.
Height from Center of Spindle to Top of Cross Slide	2⅝ in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	129
	Maximum	629

DRIVE:

Belt Widths	Spindle	2 in.
	Feed	1¼ in.
Motor Drive, H. P. Required		3
Step Diameters of Cones on Countershaft and Width of Face		8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.		462, 390, 330

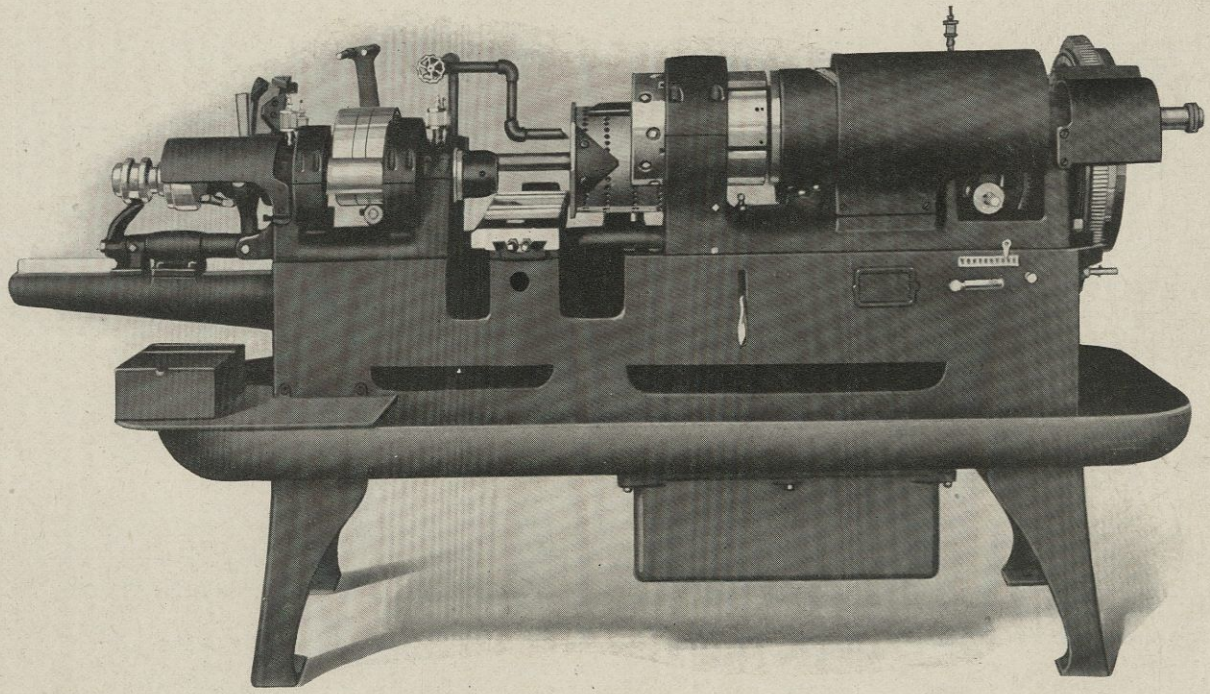
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Labium*
Air Chucking	*Airme*
Slotting and Slabbing (with Machine)	*Factor*
Third Spindle Speed	*Oakling*
Thread Rolling	*Dothanme*
Independent Cut-off	*Mobileme*
High Speed Drilling, Counterboring and Reaming	*Gablet*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabalize*
Overhanging Turret Turning	*Revereme*

FLOOR SPACE 54x126 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	4700 lbs.

It is a well known saying that a man is fearfully and wonderfully made. So is the CLEVELAND.



1¼-1½ Inch Turret Full Automatic Machine—Model A

MODEL A

1 1/4—1 1/2 Inch Turret Full Automatic Machine

CODE—FAINTLESS

RANGE:

Chuck Capacity	1½ in.
Length of Stock Feed	10½ in.
Milling Length	6 in.
Longitudinal Adjustment of Turret Head on Bed	4 in.
Turret Face to Face of Chuck—Minimum	5 3/16 in.
Turret Face to Face of Chuck—Maximum	9 3/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1½ in.
Height from Center of Spindle to Top of Cross Slide	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	91
Speeds, R. P. M.—Maximum	405

DRIVE:

Belt Widths—Spindle	2 in.
Belt Widths—Feed	1¼ in.
Motor Drive, H. P. Required	3
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.	462, 390, 330

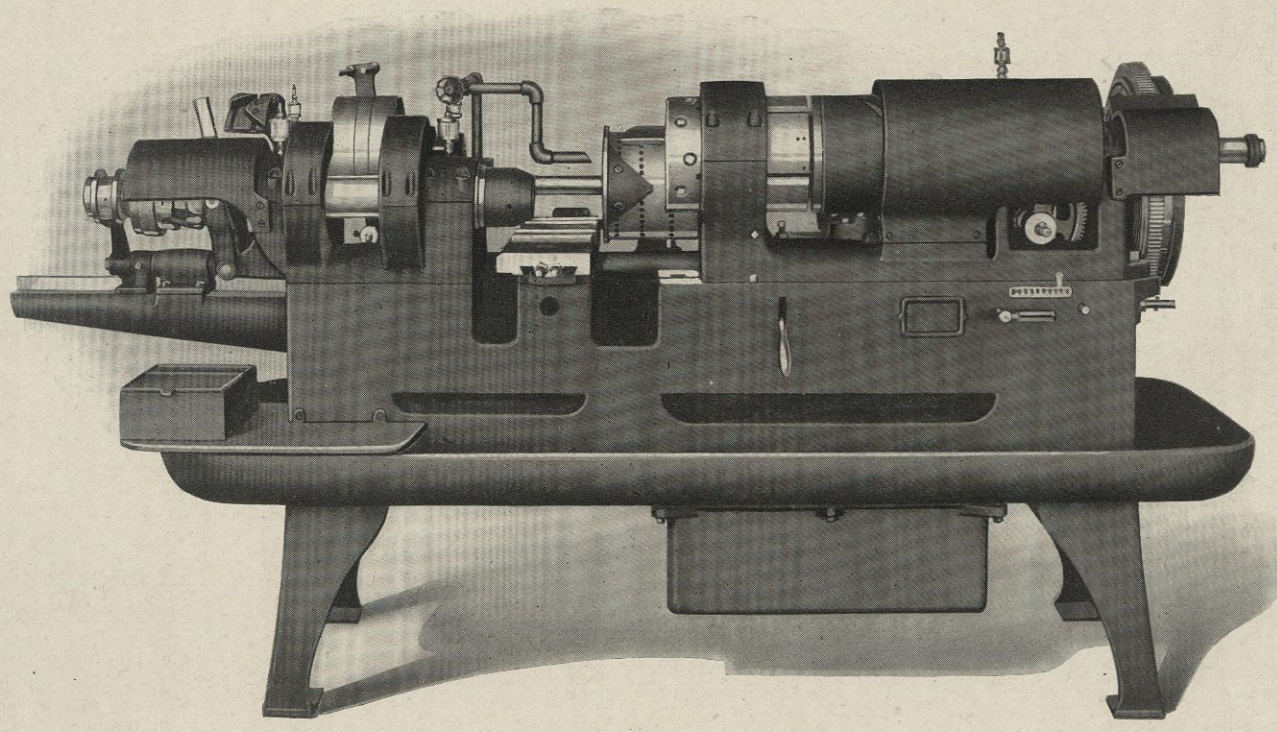
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Labium*
Air Chucking	*Aircal*
Third Spindle Speed	*Oakpin*
Thread Rolling	*Dothancal*
Independent Cut-off	*Mobilecal*
High Speed Drilling, Counterboring and Reaming	*Gablet*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabalize*
Overhanging Turret Turning	*Reverecal*

FLOOR SPACE 54x126 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	4760 lbs.

If important things are delayed, the excuse is, "I was too busy to attend to it."
A CLEVELAND never grumbles, a little attention is all it requires.



2 Inch Turret Full Automatic Machine—Model A

RANGE:
Chuck Cap
Length of S
Milling Len
Longitudina
Turret Face

TURRET AND
Number of
Diameter o
Height from

SPINDLE SPE
Number of
Speeds, R.

DRIVE:
Belt Width
Motor Driv
Step Diame
Face....
Speeds of C

MODEL A

2 Inch Turret Full Automatic Machine

CODE—FACTUAL

acity	2	in.
Stock Feed	10½	in.
gth	6	in.
al Adjustment of Turret Head on Bed	4	in.
e to Face of Chuck Minimum	4⅝	in.
e to Face of Chuck Maximum	8⅝	in.

CROSS SLIDE:

Turret Holes	5	
f Turret Holes	1½	in.
n Center of Spindle to Top of Cross Slide	2⅝	in.

EDS:

Changes	6	
P. M. Minimum	91	
P. M. Maximum	319	
s Spindle	2	in.
s Feed	1¼	in.
e, H. P. Required	4	
ters of Cones on Countershaft and Width of	10, 11 and 12x4⅛	in.
Countershaft, R. P. M.	450, 390, 341	

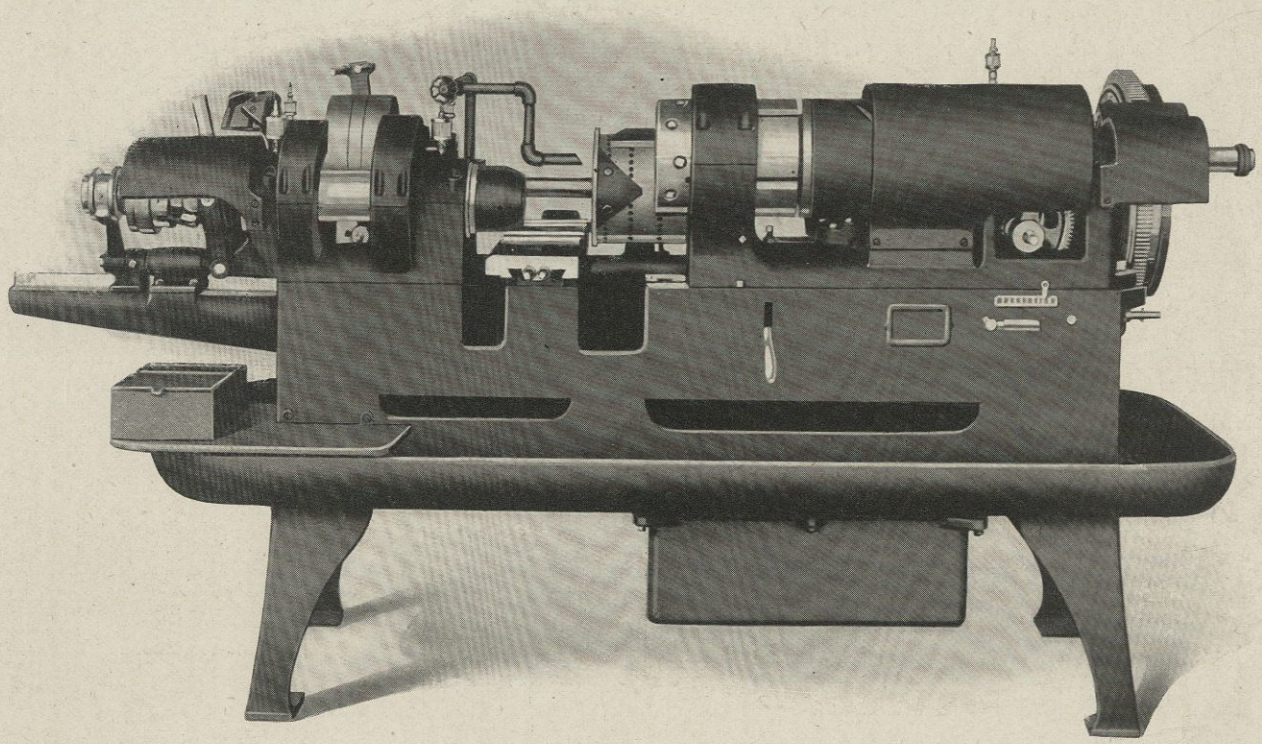
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Labros*
Air Chucking	*Airwis*
Third Spindle Speed	*Oakum*
Thread Rolling	*Dothanwis*
Independent Cut-off	*Mobilewis*
High Speed Drilling, Counterboring and Reaming	*Gablet*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabas*
Overhanging Turret Turning	*Reverewis*

FLOOR SPACE	54x126	in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425	lbs.
Foreign Shipment—Box Weight	740	lbs.
Cubic Feet Boxed for Foreign Shipment	203	
Net Weight of Machine with Countershaft	4786	lbs.

It is seldom that we cannot prepare an estimate on any piece submitted.



2-2½ Inch Turret Full Automatic Machine—Model A

MODEL A

2—2 1/2 Inch Turret Full Automatic Machine

CODE—FAIN

RANGE:

Chuck Capacity		2½ in.
Length of Stock Feed		10½ in.
Milling Length		6 in.
Longitudinal Adjustment of Turret Head on Bed		4 in.
Turret Face to Face of Chuck	Minimum	4⅝ in.
	Maximum	8⅝ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1½ in.
Height from Center of Spindle to Top of Cross Slide	2⅝ in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	91
	Maximum	319

DRIVE:

Belt Widths	Spindle	2 in.
	Feed	1¼ in.
Motor Drive, H. P. Required		4
Step Diameters of Cones on Countershaft and Width of Face		10, 11 and 12x4⅛ in.
Speeds of Countershaft, R. P. M.		450, 390, 341

STANDARD ATTACHMENTS: Code

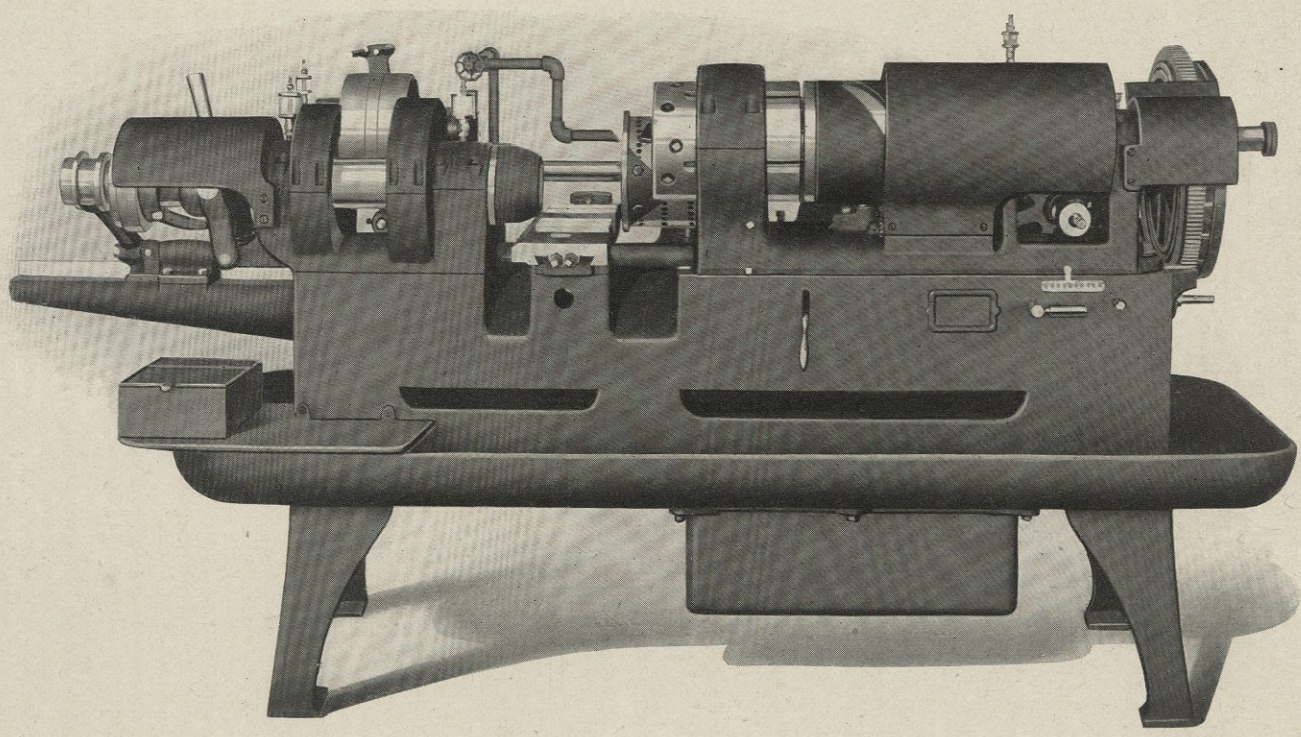
Magazine (Rotary Tilting)	*Labros*
Third Spindle Speed	*Oakum*
Thread Rolling	*Dothannj*
Independent Cut-off	*Mobilenj*
High Speed Drilling, Counterboring and Reaming	*Gablet*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabas*
Overhanging Turret Turning	*Reverenj*

FLOOR SPACE 54x126 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	4786 lbs.

The cost of operating an office is governed by the nature of the business. The cost of operating a CLEVELAND is the minimum in every case.



2-2¾ Inch Turret Full Automatic Machine—Model A

MODEL A

2—2 3/4 Inch Turret Full Automatic Machine

CODE—FAIRY

RANGE:

Chuck Capacity	2¾ in.
Length of Stock Feed	10½ in.
Milling Length	6 in.
Longitudinal Adjustment of Turret Head on Bed	4 in.
Turret Face to Face of Chuck—Minimum	5⅛ in.
Turret Face to Face of Chuck—Maximum	9⅛ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1½ in.
Height from Center of Spindle to Top of Cross Slide	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	88
Speeds, R. P. M.—Maximum	321

DRIVE:

Belt Widths—Spindle	2 in.
Belt Widths—Feed	1¼ in.
Motor Drive, H. P. Required	4
Step Diameters of Cones on Countershaft and Width of Face	10, 11 and 12x4⅛ in.
Speeds of Countershaft, R. P. M.	450, 390, 341

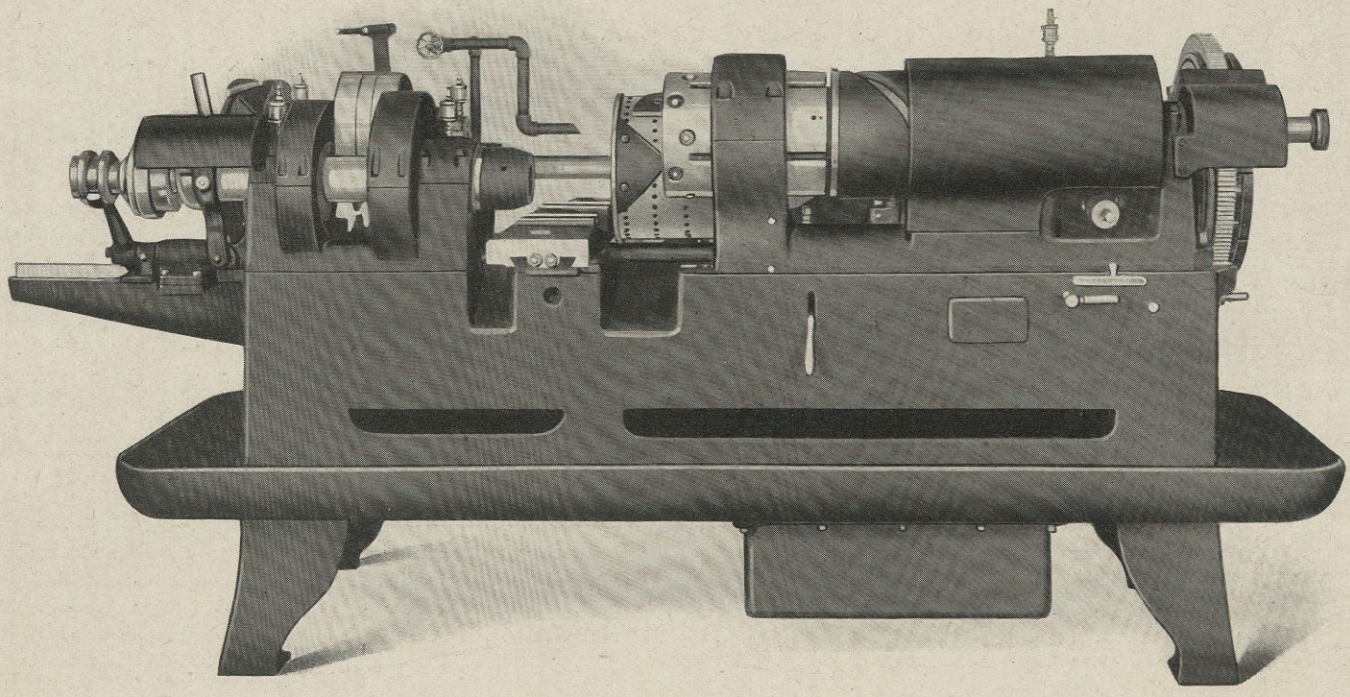
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Labros*
Third Spindle Speed	*Oaky*
Thread Rolling	*Dothanla*
Independent Cut-off	*Mobilela*
High Speed Drilling, Counterboring and Reaming	*Gablet*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabas*
Overhanging Turret Turning	*Reverela*

FLOOR SPACE 54x126 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	4819 lbs.

We would like to have you realize that poor designing is not associated with our product.



2¼ Inch Turret Full Automatic Machine—Model A

MODEL A

2 1/4 Inch Turret Full Automatic Machine

CODE—FACTUM

RANGE:

Chuck Capacity	2¼ in.
Length of Stock Feed	12⅝ in.
Milling Length	7 in.
Longitudinal Adjustment of Turret Head on Bed	5¼ in.
Turret Face to Face of Chuck, Minimum	6¼ in.
Turret Face to Face of Chuck, Maximum	11½ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1¾ in.
Height from Center of Spindle to Top of Cross Slide	2¾ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	81
Speeds, R. P. M., Maximum	250

DRIVE:

Belt Widths, Spindle	2¼ in.
Belt Widths, Feed	1¼ in.
Motor Drive, H. P. Required	5
Step Diameters of Cones on Countershaft and Width of Face	10, 11 and 12x4⅛ in.
Speeds of Countershaft, R. P. M.	450, 390, 341

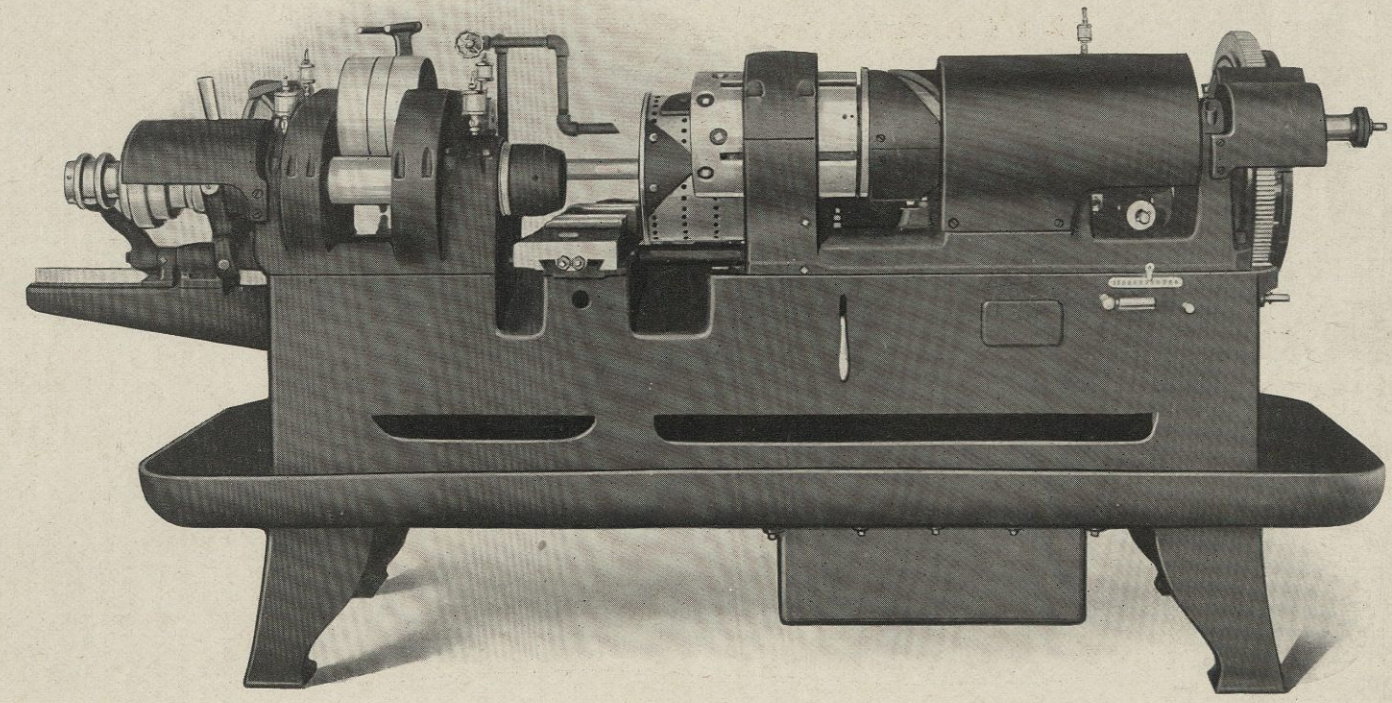
	Code
STANDARD ATTACHMENTS:	
Third Spindle Speed	*Oar*
Thread Rolling	*Dothannd*
Independent Cut-off	*Mobilend*
High Speed Drilling, Counterboring and Reaming	*Gaff*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabler*
Overhanging Turret Turning	*Reverend*

FLOOR SPACE 66x138 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	612 lbs.
Foreign Shipment—Box Weight	990 lbs.
Cubic Feet Boxed for Foreign Shipment	266.7
Net Weight of Machine with Countershaft	6213 lbs.

The inactive brain, from the absence of anything to do, never properly develops. The CLEVELAND is always highly developed and always active.



2¼-2¾ Inch Turret Full Automatic Machine—Model A

MODEL A

2 1/4—2 3/4 Inch Turret Full Automatic Machine

CODE—FADGER

RANGE:

Chuck Capacity	2¾ in.
Length of Stock Feed	12⅝ in.
Milling Length	7 in.
Longitudinal Adjustment of Turret Head on Bed	5¼ in.
Turret Face to Face of Chuck—Minimum	5⅞ in.
Turret Face to Face of Chuck—Maximum	11⅛ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1¾ in.
Height from Center of Spindle to Top of Cross Slide	2¾ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	81
Speeds, R. P. M.—Maximum	250

DRIVE:

Belt Widths—Spindle	2¾ in.
Belt Widths—Feed	1¼ in.
Motor Drive, H. P. Required	5
Step Diameters of Cones on Countershaft and Width of Face	10, 11 and 12x4⅛ in.
Speeds of Countershaft, R. P. M.	450, 390, 341

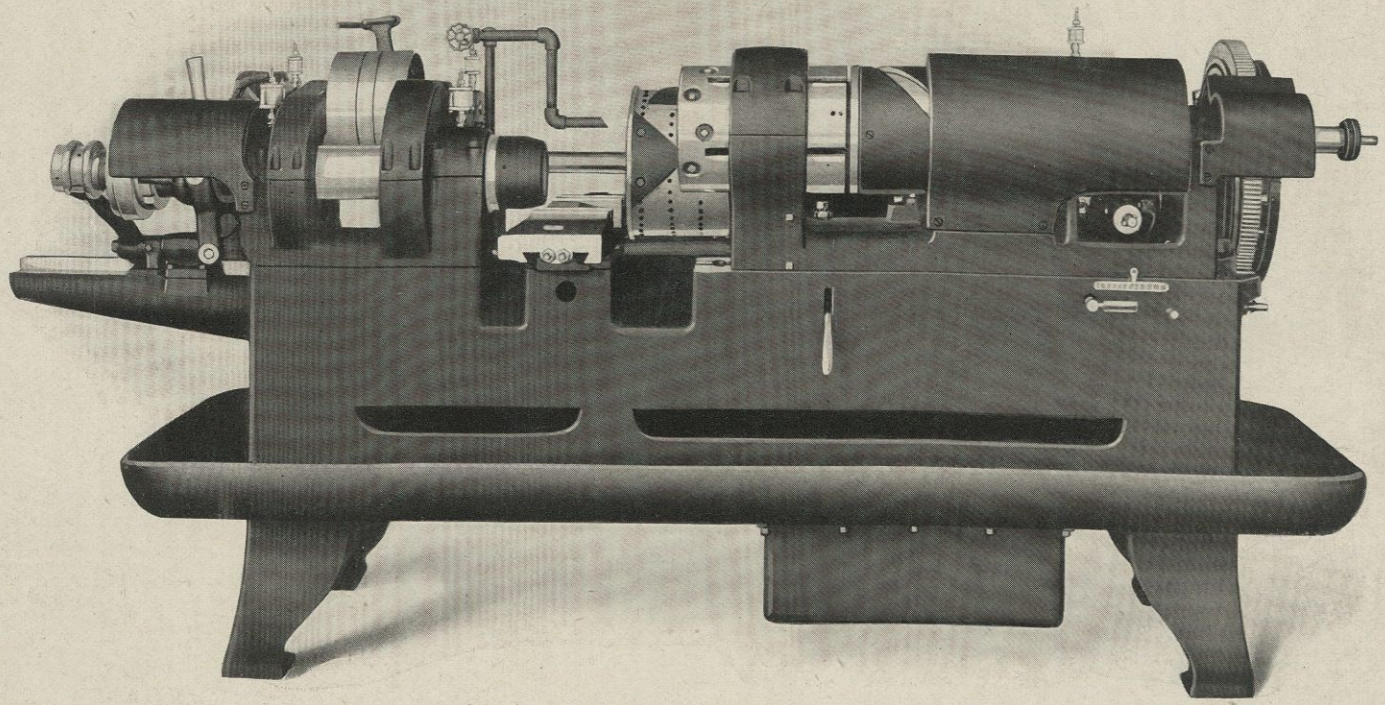
STANDARD ATTACHMENTS:	**Code**
Third Spindle Speed	*Oared*
Thread Rolling	*Dothania*
Independent Cut-off	*Mobileia*
High Speed Drilling, Counterboring and Reaming	*Gaff*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabler*
Overhanging Turret Turning	*Revereia*

FLOOR SPACE 66x138 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	612 lbs.
Foreign Shipment—Box Weight	990 lbs.
Cubic Feet Boxed for Foreign Shipment	266.7
Net Weight of Machine with Countershaft	6295 lbs.

Purchasing machinery at random is a game of chance. Purchasing CLEVELANDS eliminates future anxiety.



2¼-3¼ Inch Turret Full Automatic Machine—Model A

MODEL A

2 1/4—3 1/4 Inch Turret Full Automatic Machine

CODE—FADLIP

RANGE:

Chuck Capacity		3¼ in.
Length of Stock Feed		12⅝ in.
Milling Length		7 in.
Longitudinal Adjustment of Turret Head on Bed		5¼ in.
Turret Face to Face of Chuck	Minimum	5⅞ in.
	Maximum	11⅛ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1¾ in.
Height from Center of Spindle to Top of Cross Slide	2¾ in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	81
	Maximum	250

DRIVE:

Belt Widths	Spindle	2¾ in.
	Feed	1¼ in.
Motor Drive, H. P. Required		5
Step Diameters of Cones on Countershaft and Width of Face		10, 11 and 12x4⅛ in.
Speeds of Countershaft, R. P. M.		450, 390, 341

STANDARD ATTACHMENTS:

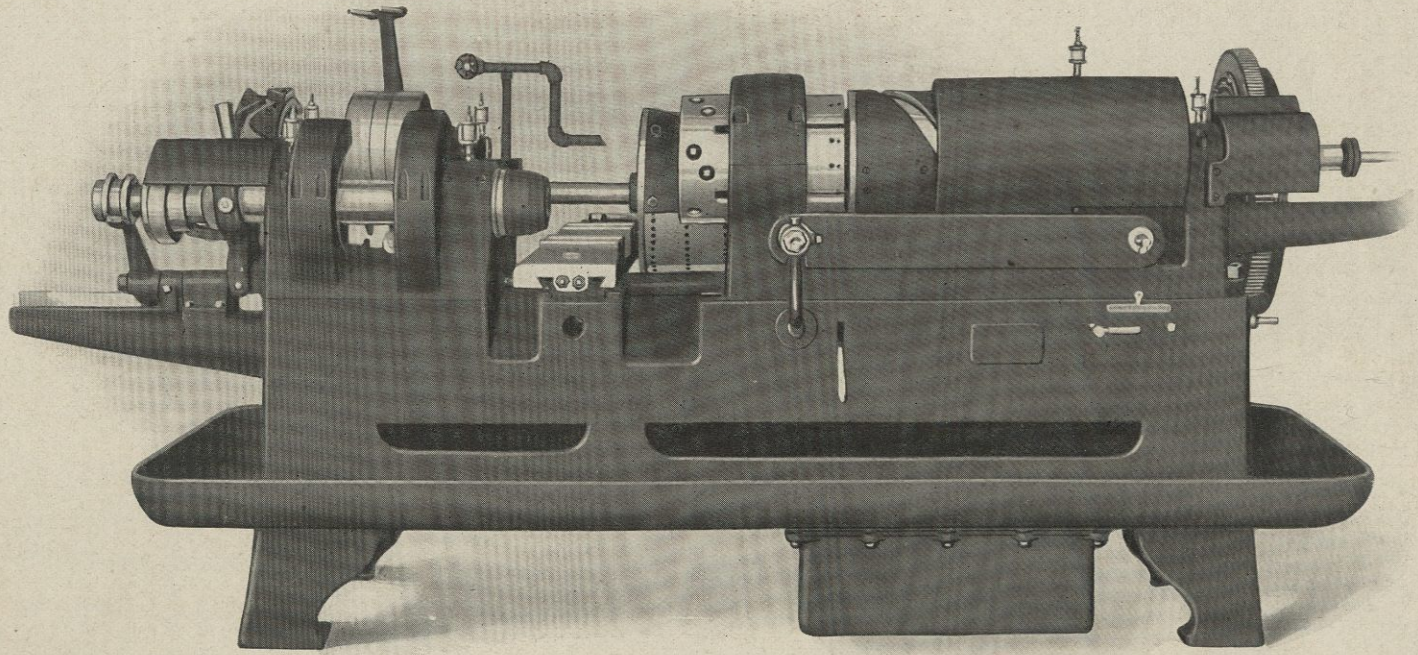
	Code
Third Spindle Speed	*Oared*
Thread Rolling	*Dothanind*
Independent Cut-off	*Mobileind*
High Speed Drilling, Counterboring and Reaming	*Gaff*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabler*
Overhanging Turret Turning	*Revereind*

FLOOR SPACE 66x138 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	612 lbs.
Foreign Shipment—Box Weight	990 lbs.
Cubic Feet Boxed for Foreign Shipment	266.7
Net Weight of Machine with Countershaft	6295 lbs.

It is seldom that a man at the top is there through friendship or dollars; it is ability that counts. The same can be said of the CLEVELAND.



2¾ Inch Turret Full Automatic Machine—Model A

MODEL A

2 3/4 Inch Turret Full Automatic Machine

CODE—FADE

RANGE:

Chuck Capacity	2¾ in.
Length of Stock Feed	13⅝ in.
Milling Length	7⅝ in.
Longitudinal Adjustment of Turret Head on Bed	5½ in.
Turret Face to Face of Chuck—Minimum	6 13/16 in.
Turret Face to Face of Chuck—Maximum	12 5/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	2¼ in.
Height from Center of Spindle to Top of Cross Slide	2¾ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	72
Speeds, R. P. M.—Maximum	242

DRIVE:

Belt Widths—Spindle	2¾ in.
Belt Widths—Feed	1¾ in.
Motor Drive, H. P. Required	6
Step Diameters of Cones on Countershaft and Width of Face	11, 12½ and 14x4⅛ in.
Speeds of Countershaft, R. P. M.	436, 360, 300

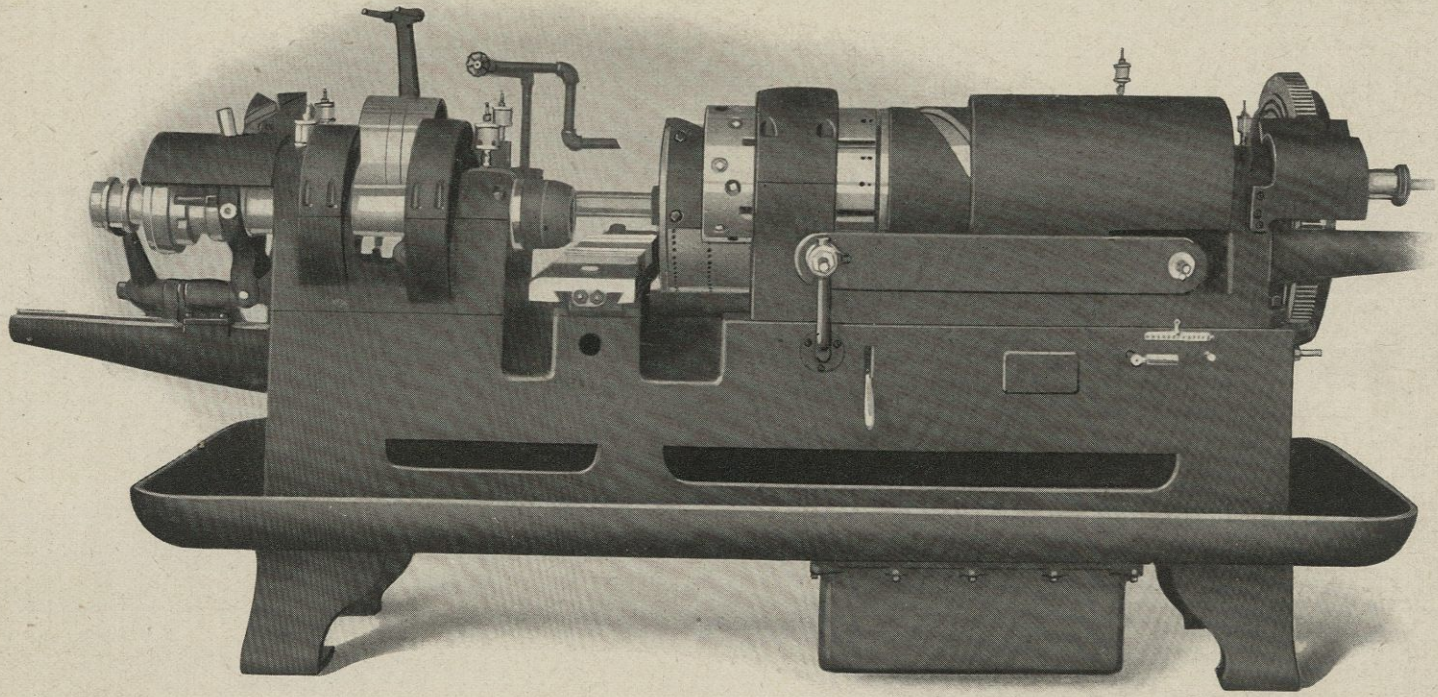
STANDARD ATTACHMENTS:	Code
Third Spindle Speed	*Oast*
Thread Rolling	*Dothanri*
Independent Cut-off	*Mobileri*
High Speed Drilling, Counterboring and Reaming	*Gage*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabin*
Overhanging Turret Turning	*Revereri*

FLOOR SPACE 70x155 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	724 lbs.
Foreign Shipment—Box Weight	1140 lbs.
Cubic Feet Boxed for Foreign Shipment	335.8
Net Weight of Machine with Countershaft	8926 lbs.

The CLEVELAND is a reliable piece of mechanism, a real friend, easy to control.



2¾-3¼ Inch Turret Full Automatic Machine—Model A

MODEL A

2 3/4—3 1/4 Inch Turret Full Automatic Machine

CODE—FADED

RANGE:

Chuck Capacity	3¼ in.
Length of Stock Feed	13⅝ in.
Milling Length	7⅝ in.
Longitudinal Adjustment of Turret Head on Bed	5½ in.
Turret Face to Face of Chuck, Minimum	6 13/16 in.
Turret Face to Face of Chuck, Maximum	12 5/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	2¼ in.
Height from Center of Spindle to Top of Cross Slide	2¾ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	72
Speeds, R. P. M., Maximum	242

DRIVE:

Belt Widths, Spindle	2¾ in.
Belt Widths, Feed	1¾ in.
Motor Drive, H. P. Required	6
Step Diameters of Cones on Countershaft and Width of Face	11, 12½ and 14x4⅛ in.
Speeds of Countershaft, R. P. M.	436, 360, 300

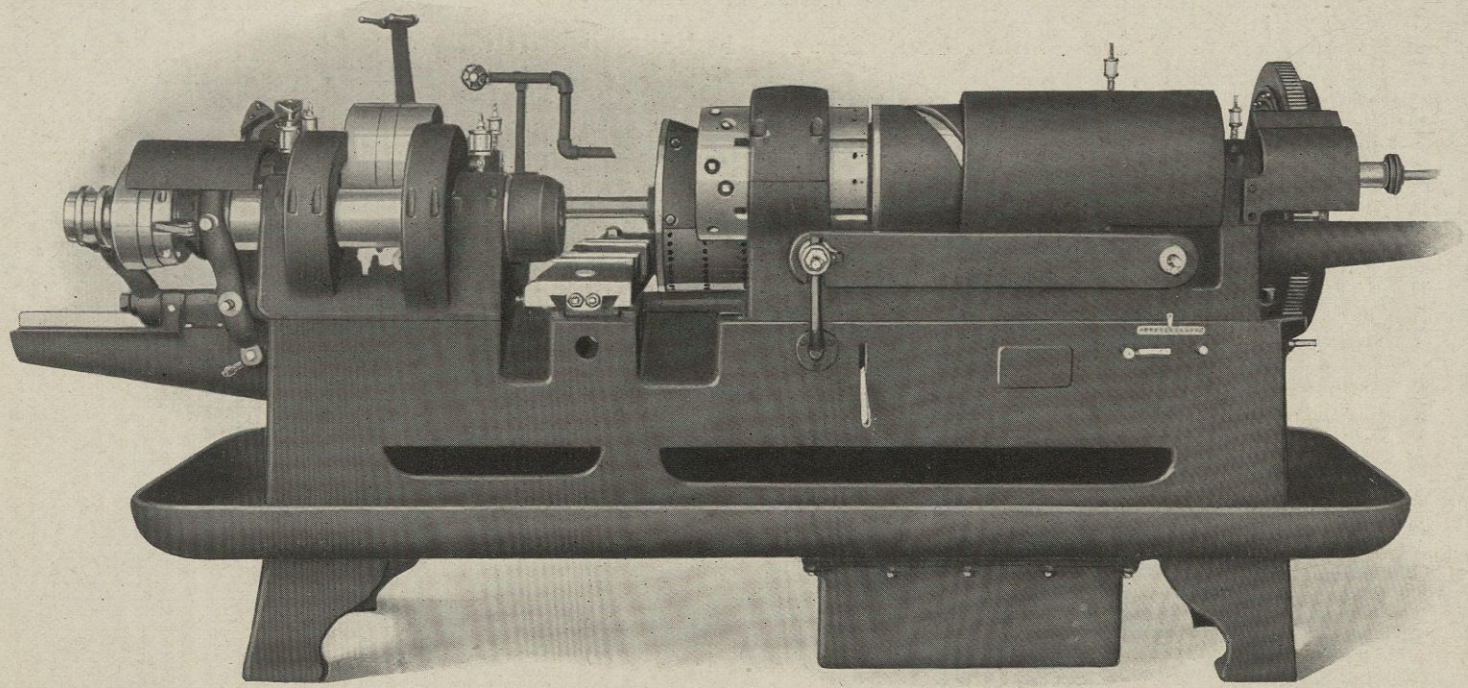
	Code
STANDARD ATTACHMENTS:	
Third Spindle Speed	*Oastab*
Thread Rolling	*Dothanky*
Independent Cut-off	*Mobileky*
High Speed Drilling, Counterboring and Reaming	*Gage*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabin*
Overhanging Turret Turning	*Revereky*

FLOOR SPACE 70x155 in.

SHIPPING DIMENSIONS:

Domestic Shipment	724 lbs.
Foreign Shipment—Box Weight	1140 lbs
Cubic Feet Boxed for Foreign Shipment	335.8
Net Weight of Machine with Countershaft	8926 lbs.

We would be willing to pay for a clever criticism that contains facts. An ad must be imperative; foolish talk is transparent.



2¾-3¾ Inch Turret Full Automatic Machine—Model A

MODEL A

2 3/4—3 3/4 Inch Turret Full Automatic Machine

CODE—FADEDLY

RANGE:

Chuck Capacity	3¾ in.
Length of Stock Feed	13⅝ in.
Milling Length	7⅝ in.
Longitudinal Adjustment of Turret Head on Bed	5½ in.
Turret Face to Face of Chuck—Minimum	6⅞ in.
Turret Face to Face of Chuck—Maximum	12⅜ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	2¼ in.
Height from Center of Spindle to Top of Cross Slide	2¾ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	43
Speeds, R. P. M.—Maximum	242

DRIVE:

Belt Widths—Spindle	2¾ in.
Belt Widths—Feed	1¾ in.
Motor Drive, H. P. Required	6
Step Diameters of Cones on Countershaft and Width of Face	11, 12½ and 14x4⅛ in.
Speeds of Countershaft, R. P. M.	436, 360, 300

STANDARD ATTACHMENTS:

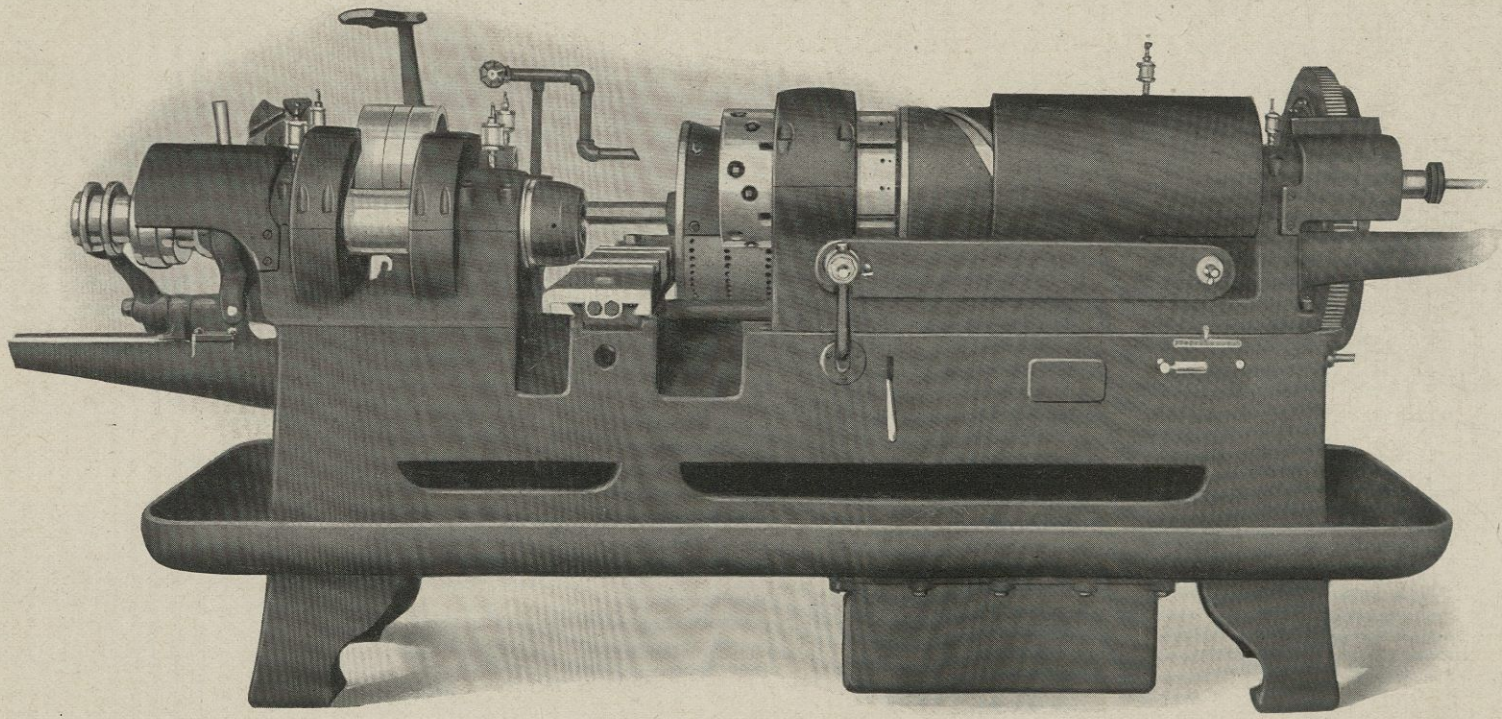
	Code
Third Spindle Speed	*Oasteck*
High Speed Drilling, Counterboring and Reaming	*Gage*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabin*
Overhanging Turret Turning	*Revereore*

FLOOR SPACE 70x155 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	724 lbs.
Foreign Shipment—Box Weight	1140 lbs.
Cubic Feet Boxed for Foreign Shipment	335. 8
Net Weight of Machine with Countershaft	9234 lbs.

Do not forget the CLEVELAND, which is a real "Safety First."



2¾-4 Inch Turret Full Automatic Machine—Model A

MODEL A

2 3/4—4 Inch Turret Full Automatic Machine

CODE—FAMOUS

RANGE:

Chuck Capacity	4 in.
Length of Stock Feed	13⅝ in.
Milling Length	7⅝ in.
Longitudinal Adjustment of Turret Head on Bed	5½ in.
Turret Face to Face of Chuck, Minimum	6⅞ in.
Turret Face to Face of Chuck, Maximum	12⅜ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	2¼ in.
Height from Center of Spindle to Top of Cross Slide	2¾ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	43
Speeds, R. P. M., Maximum	242

DRIVE:

Belt Widths, Spindle	2¾ in.
Belt Widths, Feed	1¾ in.
Motor Drive, H. P. Required	7
Step Diameters of Cones on Countershaft and Width of Face	11, 12½ and 14x4⅛ in.
Speeds of Countershaft, R. P. M.	436, 360, 300

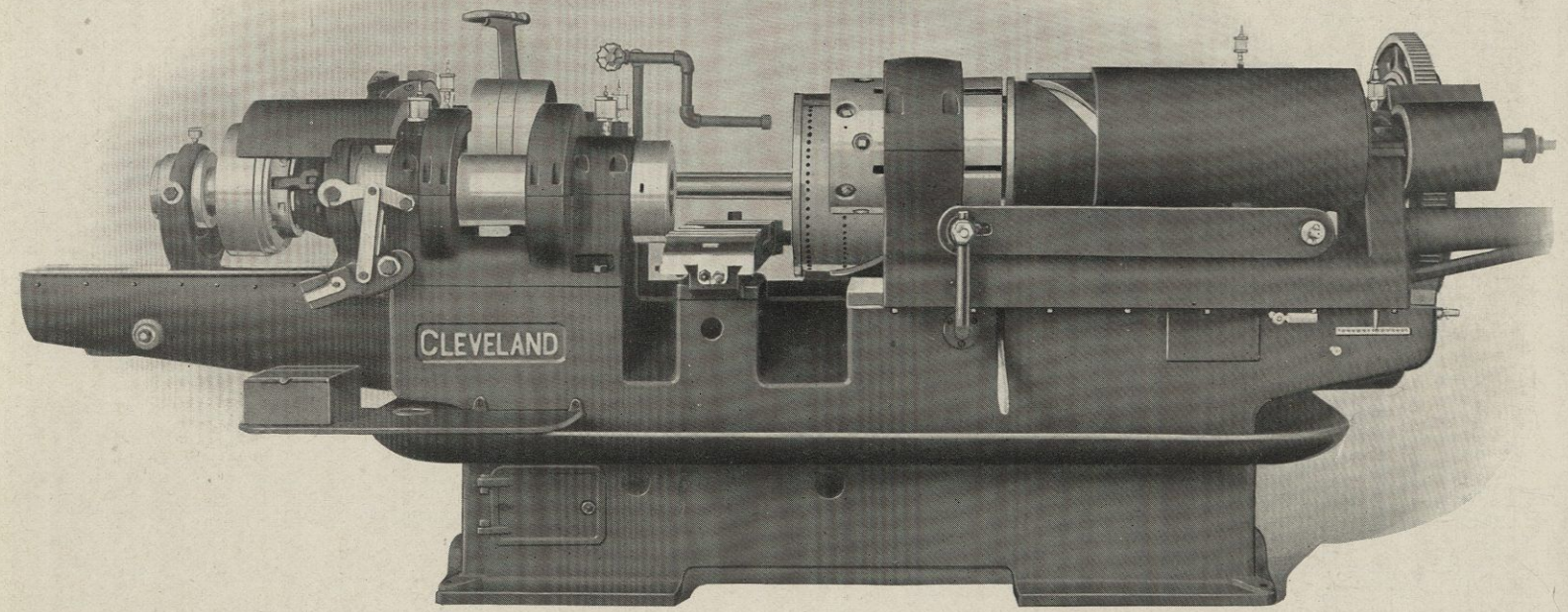
	Code
STANDARD ATTACHMENTS:	
Third Spindle Speed	*Oastcey*
High Speed Drilling, Counterboring and Reaming	*Gage*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabin*
Overhanging Turret Turning	*Reverega*

FLOOR SPACE 70x155 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	724 lbs.
Foreign Shipment—Box Weight	1140 lbs.
Cubic Feet Boxed for Foreign Shipment	335.8
Net Weight of Machine with Countershaft	9390 lbs.

Detest the man who always informs you on the side that you are a fool to work so hard. The CLEVELAND will not listen to such bad advice.



4¼ Inch Turret Full Automatic Machine—Model A

MODEL A

4 1/4 Inch Turret Full Automatic Machine

CODE—FADGE

RANGE:

Chuck Capacity		4¼ in.
Length of Stock Feed		16⅝ in.
Milling Length		9 in.
Longitudinal Adjustment of Turret Head on Bed		7 in.
Turret Face to Face of Chuck	Minimum	9⅞ in.
	Maximum	16⅞ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	2¾ in.
Height from Center of Spindle to Top of Cross Slide	4 in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	44
	Maximum	139

DRIVE:

Belt Widths	Spindle	3 in.
	Feed	1¾ in.
Motor Drive, H. P. Required		8
Step Diameters of Cones on Countershaft and Width of Face		12½, 14 and 15½x5¼ in.
Speeds of Countershaft, R. P. M.		436, 360, 300

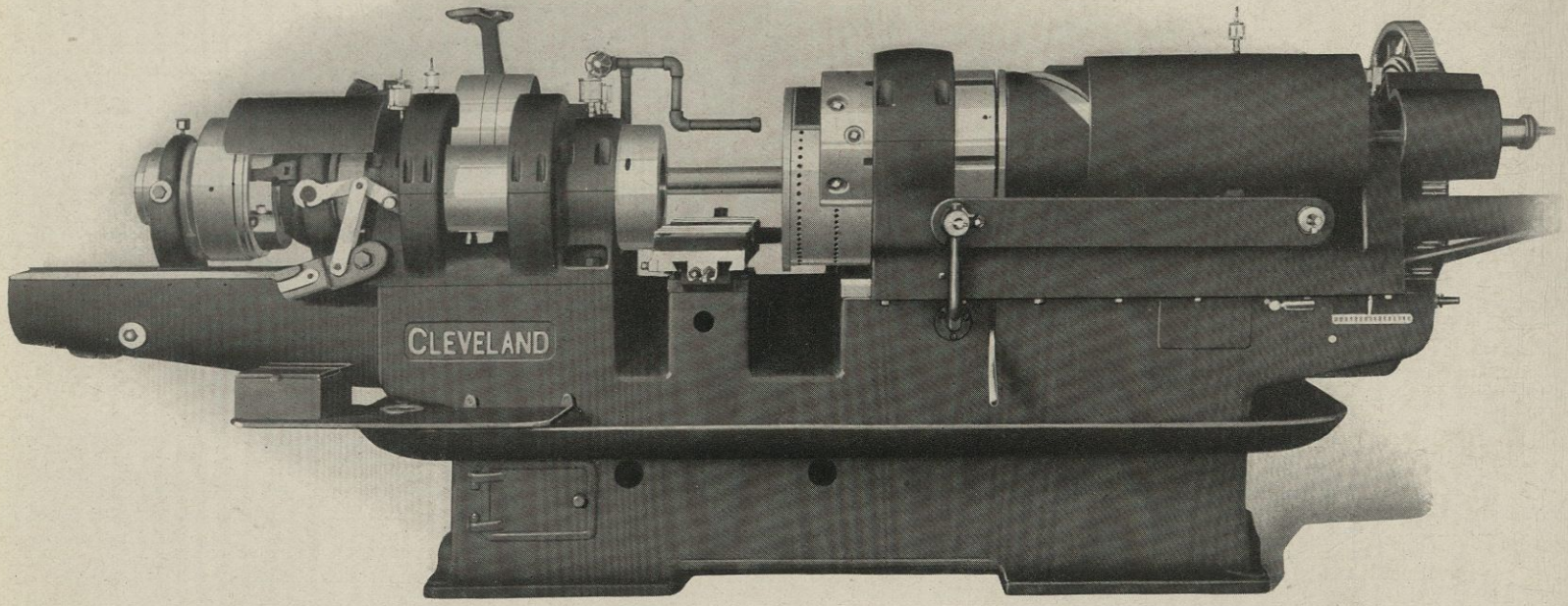
	Code
STANDARD ATTACHMENTS:	
Third Spindle Speed	*Oaster*
Oil Feed through Turret	*Oil*
Double Cross Slide	*Cabinal*
Overhanging Turret Turning	*Revereala*

FLOOR SPACE ..... 76x186 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	1260 lbs.
Foreign Shipment—Box Weight	1735 lbs.
Cubic Feet Boxed for Foreign Shipment	454.9
Net Weight of Machine with Countershaft	11604 lbs.

Twenty-five years before the public advancing steadily means a good reputation.



5½ Inch Turret Full Automatic Machine—Model A

MODEL A

5 1/2 Inch Turret Full Automatic Machine

CODE—FANATIC

RANGE:

Chuck Capacity	5½	in.
Length of Stock Feed	16⅝	in.
Milling Length	9	in.
Longitudinal Adjustment of Turret Head on Bed	7	in.
Turret Face to Face of Chuck — Minimum	9⅞	in.
Turret Face to Face of Chuck — Maximum	16⅞	in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5	
Diameter of Turret Holes	2¾	in.
Height from Center of Spindle to Top of Cross Slide	4	in.

SPINDLE SPEEDS:

Number of Changes	6	
Speeds, R. P. M. — Minimum	40	
Speeds, R. P. M. — Maximum	116	

DRIVE:

Belt Widths — Spindle	3	in.
Belt Widths — Feed	1¾	in.
Motor Drive, H. P. Required	8	
Step Diameters of Cones on Countershaft and Width of Face	12½, 14 and 15½x5¼	in.
Speeds of Countershaft, R. P. M.	436, 360, 300	

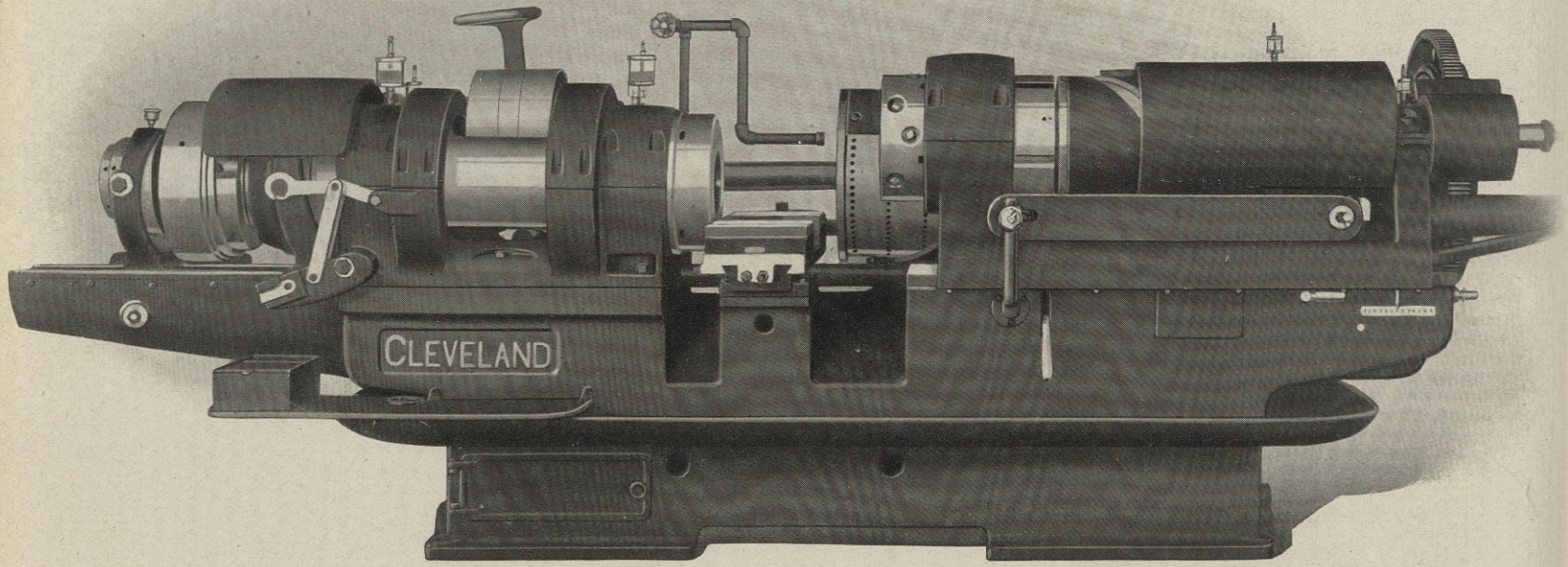
	Code
STANDARD ATTACHMENTS:	
Third Spindle Speed	*Oastdie*
Oil Feed through Turret	*Oil*
Double Cross Slides	*Cabinal*
Overhanging Turret Turning	*Revereut*

FLOOR SPACE ..... 76x186 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	1260 lbs.
Foreign Shipment—Box Weight	1735 lbs.
Cubic Feet Boxed for Foreign Shipment	454. 9
Net Weight of Machine with Countershaft	12600 lbs.

Efficiency nowadays is thought of by all kinds of people who populate the globe. CLEVELANDS are of great assistance in a case of this kind.



6¾ Inch Turret Full Automatic Machine—Model A

MODEL A

6 3/4 Inch Turret Full Automatic Machine

CODE—FANGLITE

RANGE:

Chuck Capacity	6¾ in.
Length of Stock Feed	16⅝ in.
Milling Length	9 in.
Longitudinal Adjustment of Turret Head on Bed	7¼ in.
Turret Face to Face of Chuck, Minimum	11 11/16 in.
Turret Face to Face of Chuck, Maximum	18 15/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	4
Diameter of Turret Holes	2¾ in.
Height from Center of Spindle to Top of Cross Slide	4¼ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	22
Speeds, R. P. M., Maximum	91

DRIVE:

Belt Widths, Spindle	3¾ in.
Belt Widths, Feed	1¾ in.
Motor Drive, H. P. Required	10
Step Diameters of Cones on Countershaft and Width of Face	12½, 14 and 15½x5¼ in.
Speeds of Countershaft, R. P. M.	436, 360, 300

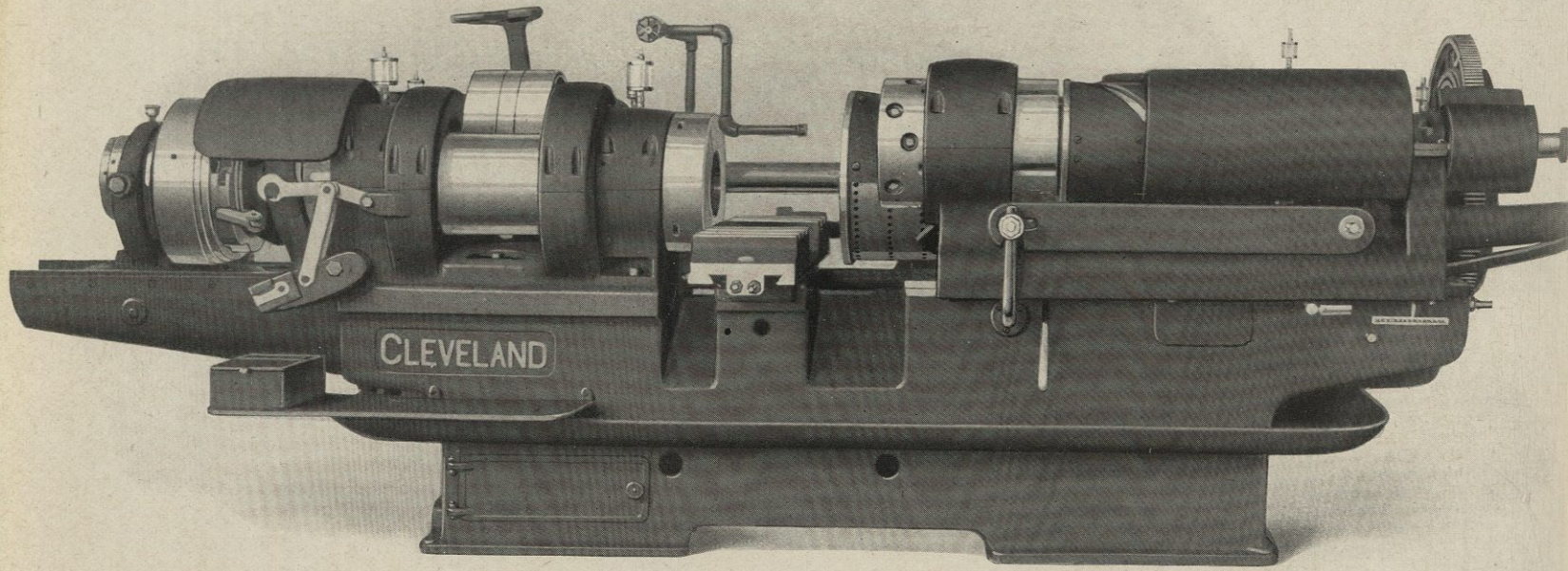
STANDARD ATTACHMENTS:	Code
Third Spindle Speed	*Oasteral*
Oil Feed through Turret	*Oil*
Overhanging Turret Turning	*Revereneb*

FLOOR SPACE 82x200 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	1440 lbs.
Foreign Shipment—Box Weight	1895 lbs.
Cubic Feet Boxed for Foreign Shipment	497.7
Net Weight of Machine with Countershaft	14510 lbs.

Our product is a great producer. It never watches the foreman or the clock; it hasn't the time.



7¾ Inch Turret Full Automatic Machine—Model A

MODEL A

7 3/4 Inch Turret Full Automatic Machine

CODE—FANGLESS

RANGE:

Chuck Capacity	7¾ in.
Length of Stock Feed	16⅝ in.
Milling Length	9 in.
Longitudinal Adjustment of Turret Head on Bed	7¼ in.
Turret Face to Face of Chuck, Minimum	11 11/16 in.
Turret Face to Face of Chuck, Maximum	18 15/16 in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	4
Diameter of Turret Holes	2¾ in.
Height from Center of Spindle to Top of Cross Slide	4¼ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	22
Speeds, R. P. M., Maximum	91

DRIVE:

Belt Widths, Spindle	3¾ in.
Belt Widths, Feed	1¾ in.
Motor Drive, H. P. Required	10
Step Diameters of Cones on Countershaft and Width of Face	12½, 14 and 15½x5¼ in.
Speeds of Countershaft, R. P. M.	436, 360, 300

STANDARD ATTACHMENTS:

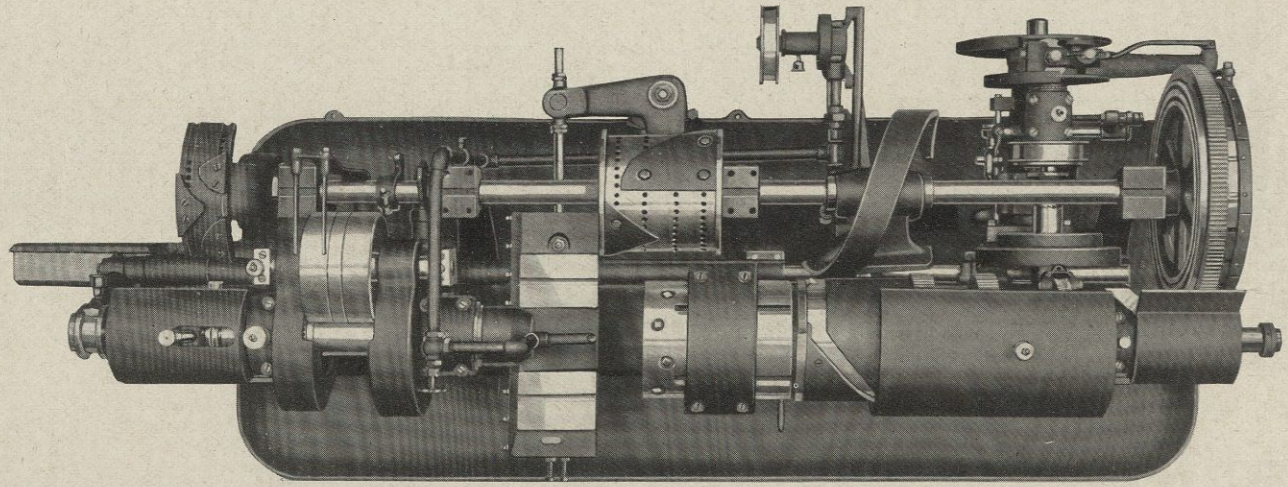
	Code
Third Spindle Speed	*Oasteral*
Oil Feed through Turret	*Oil*
Overhanging Turret Turning	*Reveretex*

FLOOR SPACE ..... 82x200 in.

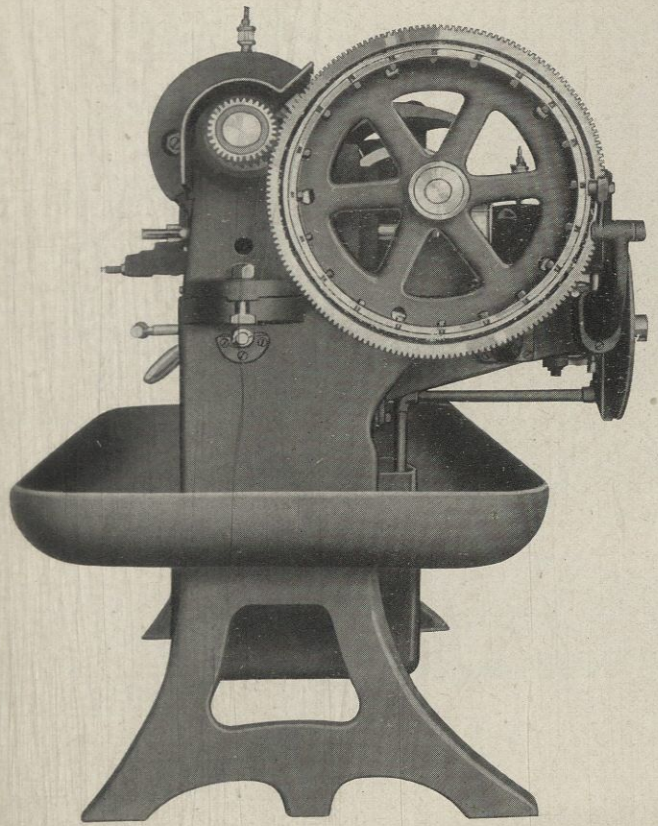
SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	1440 lbs.
Foreign Shipment—Box Weight	1895 lbs.
Cubic Feet Boxed for Foreign Shipment	497.7
Net Weight of Machine with Countershaft	15725 lbs.

When the whistle blows in the morning, the CLEVELAND is always ready to commence doing things.



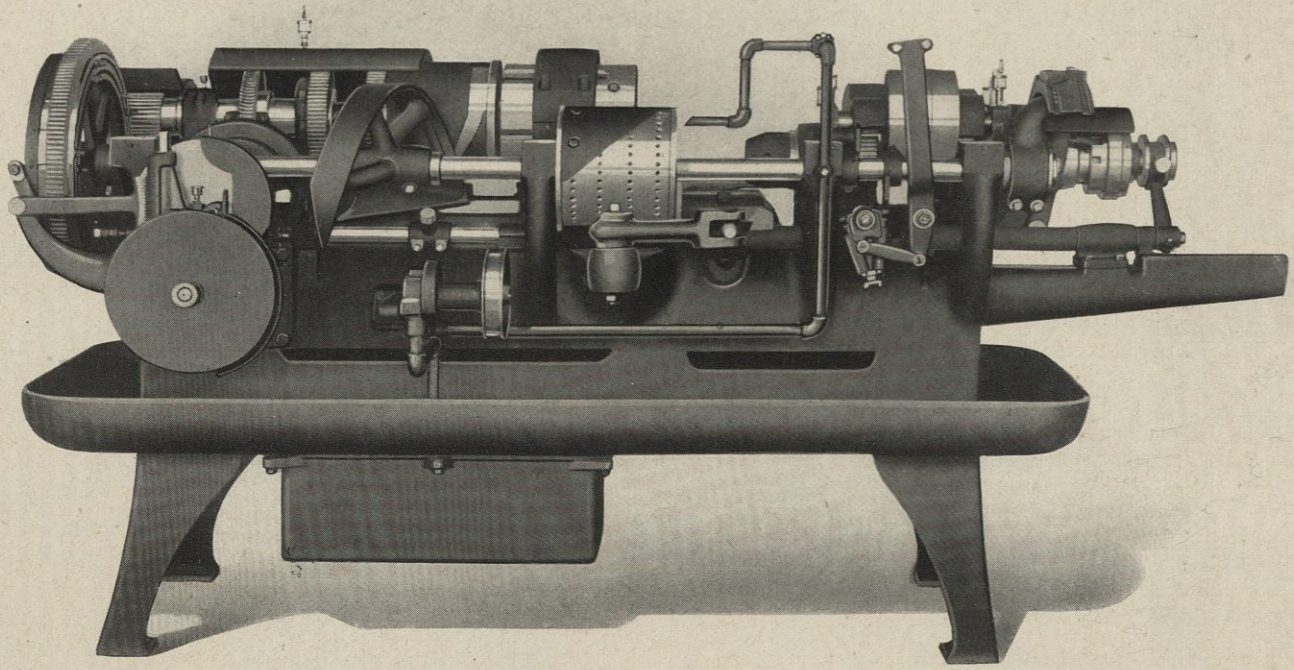
Top View 2 Inch Turret Full Automatic Machine—Model A



End View 2 Inch Model A Machine

This cut shows an end view of our 2-in. Model A CLEVELAND Automatic. We have here a good view of one of the important features of the machine, which illustrates the extreme simplicity of operating the CLEVELAND. The large wheel at the right is called the regulating wheel. The tool feed regulating segments are clearly shown by the dark line near the teeth; there are ten of these segments, two for each turret hole, which can be adjusted almost instantly and while machine is in motion, to suit the feed requirements of each individual tool. This isn't true of any other make of automatic that we know of, since it is usually necessary to change gears or alter the shape of a cam to accomplish this result.

On the opposite side of this wheel are the feed shift pins, which change the position of feed clutch from the tool feed to high speed idle motion, or vice versa. These pins can also be adjusted in a few seconds and while machine is in operation.



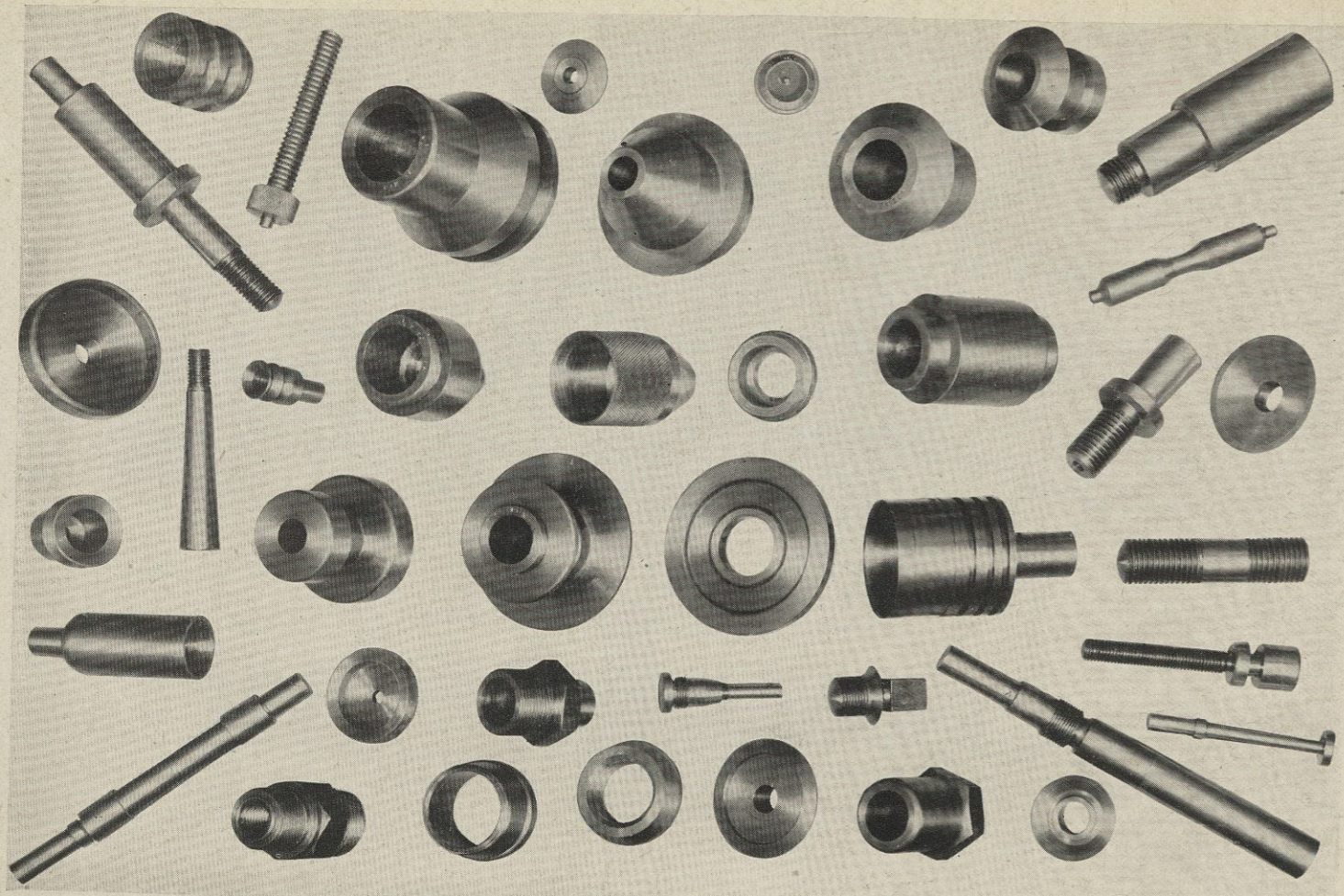
Rear View 2 Inch Turret Full Automatic Machine—Model A

Rear View of Model A

Here we show a rear view of our Model A machine, and the one thing to which we wish to call your attention is the simplicity of design and the accessibility to all working parts. The spindle head, belt shifter, and the adjustment of the cross slide and tool feed are all within easy reach from the rear of the machine. A CLEVELAND is different in this respect from nearly all the other automatics. All the mechanism on a CLEVELAND Automatic is visible, which means it is accessible without taking the machine apart in any way to make adjustments.

The rod that controls the stock feed and the stock feed segment are in a convenient location.

The points we are bringing out are important from an operator's standpoint, as there is no waste of time in making any of the adjustments above mentioned.

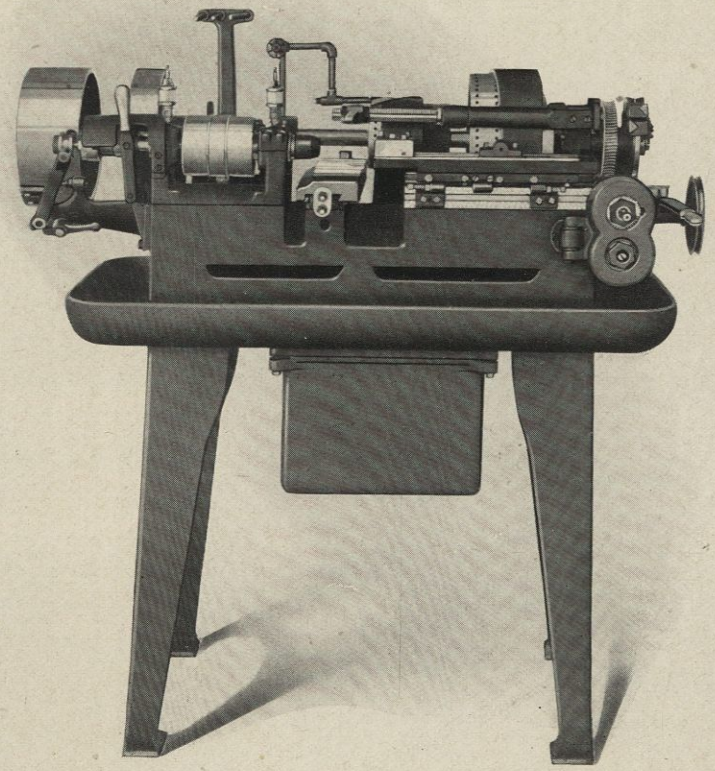


Work Produced on Turret Full Automatic Machine—Model A

Work Produced on Model A Machines

Here we show a few samples of the many thousand different shaped pieces being produced on our Model A machines.

The Model A CLEVELAND is capable of producing almost any shaped piece desired and as accurate as necessary from any kind of material. Some of the pieces shown, the drill chuck body, for instance, in the center of this cut, had to be machined absolutely accurate.



3/8 Inch Plain Full Automatic Machine—Model B

MODEL B

3/8 Inch Plain Full Automatic Machine

CODE—ABSOLUTE

RANGE:

Chuck Capacity		3/8 in.
Length of Stock Feed		5¾ in.
Milling Length		4½ in.
End of Milling Slide to Face of Chuck	Minimum	1½ in.
	Maximum	8 in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	1 5/16 in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	980
	Maximum	5000

DRIVE:

Belt Widths	Spindle	1 in.
	Feed	1¼ in.
Motor Drive, H. P. Required		1½
Step Diameters of Cones on Countershaft and Width of Face		8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.		1010, 855, 735

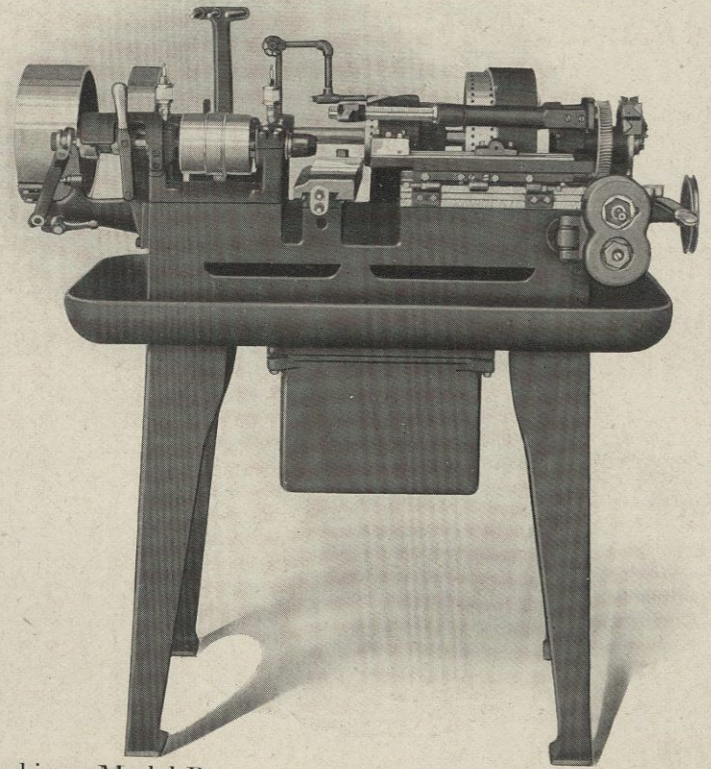
STANDARD ATTACHMENTS:	Code
Magazine (Vertical)	*Lake*
Thread Rolling	*Dothanny*
Independent Cut-off	*Mobileny*
High Speed Drilling, Counterboring and Reaming	*Gaiter*
Double Cross Slides	*Cabrit*
Cross Slide Centering, Facing or Counterboring	*Minotny*
Cross Slide Taper Turning	*Globeny*
Necking	*Eurekany*

FLOOR SPACE	34x54 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	145 lbs.
Foreign Shipment—Box Weight	335 lbs.
Cubic Feet Boxed for Foreign Shipment	69. 5
Net Weight of Machine with Countershaft	1021 lbs.

Satisfaction is our daily thought and it is rare that we are not successful in this respect.



3/8-1/2 Inch Plain Full Automatic Machine—Model B

MODEL B

3/8–1/2 Inch Plain Full Automatic Machine

CODE—ADMIRAL

RANGE:

Chuck Capacity		½ in.
Length of Stock Feed		5¾ in.
Milling Length		4½ in.
End of Milling Slide to Face of Chuck	Minimum	1½ in.
	Maximum	8 in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	1 5/16 in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	980
	Maximum	5000

DRIVE:

Belt Widths	Spindle	1 in.
	Feed	1¼ in.
Motor Drive, H. P. Required		1½ in.
Step Diameters of Cones on Countershaft and Width of Face		8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.		1010, 855, 735

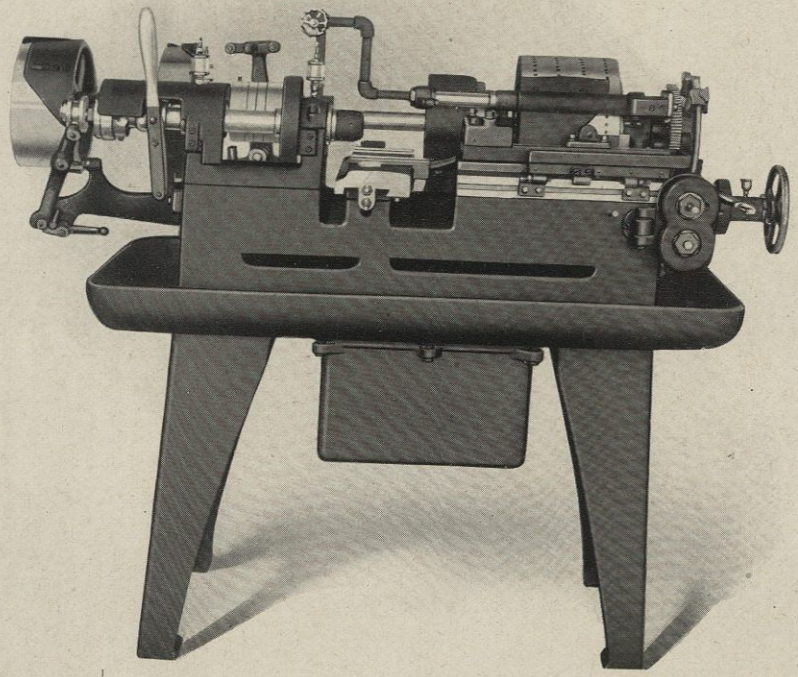
STANDARD ATTACHMENTS:	Code
Magazine (Vertical)	*Lake*
Thread Rolling	*Dothanill*
Independent Cut-off	*Mobileill*
High Speed Drilling, Counterboring and Reaming	*Gaiter*
Double Cross Slides	*Cabrit*
Cross Slide Centering, Drilling, Reaming and Tapping	*Minotill*
Cross Slide Taper Turning	*Globeill*
Necking	*Eurekaill*

FLOOR SPACE	34x54 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	145 lbs.
Foreign Shipment—Box Weight	335 lbs.
Cubic Feet Boxed for Foreign Shipment	69.5
Net Weight of Machine with Countershaft	1021 lbs.

Everything that is useless in a man's movements is an exertion without results. Operating a battery of CLEVELANDS means very little exertion with great results.



5/8 Inch Plain Full Automatic Machine—Model B

MODEL B

5/8 Inch Plain Full Automatic Machine

CODE—AMPUTATE

RANGE:

Chuck Capacity	5/8 in.
Length of Stock Feed	8½ in.
Milling Length	7½ in.
End of Milling Slide to Face of Chuck, Minimum	1½ in.
End of Milling Slide to Face of Chuck, Maximum	11½ in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	2¼ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	282
Speeds, R. P. M., Maximum	1243

DRIVE:

Belt Widths, Spindle	1½ in.
Belt Widths, Feed	1¼ in.
Motor Drive, H. P. Required	2
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.	533, 450, 385

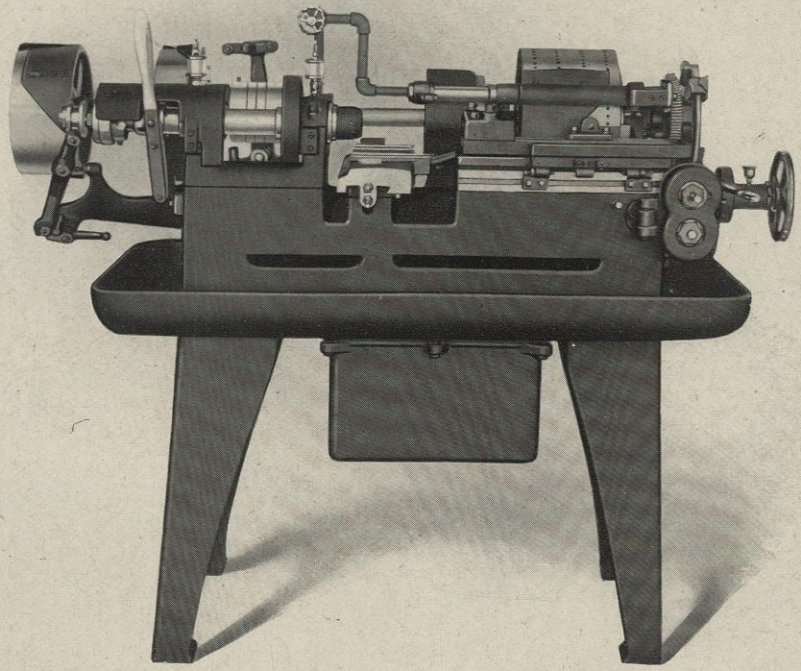
STANDARD ATTACHMENTS:	Code
Magazine (Vertical)	*Lance*
Thread Rolling	*Dothanmo*
Independent Cut-off	*Mobilemo*
High Speed Drilling, Counterboring and Reaming	*Gale*
Double Cross Slides	*Caburn*
Cross Slide Centering, Drilling, Reaming and Tapping	*Minotmo*
Cross Slide Taper Turning	*Globemo*
Necking	*Eurekamo*

FLOOR SPACE 38x69 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	270 lbs.
Foreign Shipment—Box Weight	433 lbs.
Cubic Feet Boxed for Foreign Shipment	96. 9
Net Weight of Machine with Countershaft	1675 lbs.

The CLEVELAND is one of the most nourishing and lasting of factory equipments.



5/8-7/8 Inch Plain Full Automatic Machine—Model B

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Page 68 missing in original

MODEL B

1 1/4 Inch Plain Full Automatic Machine

CODE—ARTEMUS

RANGE:

Chuck Capacity	1¼ in.
Length of Stock Feed	7½ in.
Milling Length	7½ in.
End of Milling Slide to Face of Chuck—Minimum	3 in.
End of Milling Slide to Face of Chuck—Maximum	15½ in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	129
Speeds, R. P. M.—Maximum	629

DRIVE:

Belt Widths—Spindle	2 in.
Belt Widths—Feed	1½ in.
Motor Drive, H. P. Required	3
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.	462, 390, 330

STANDARD ATTACHMENTS:

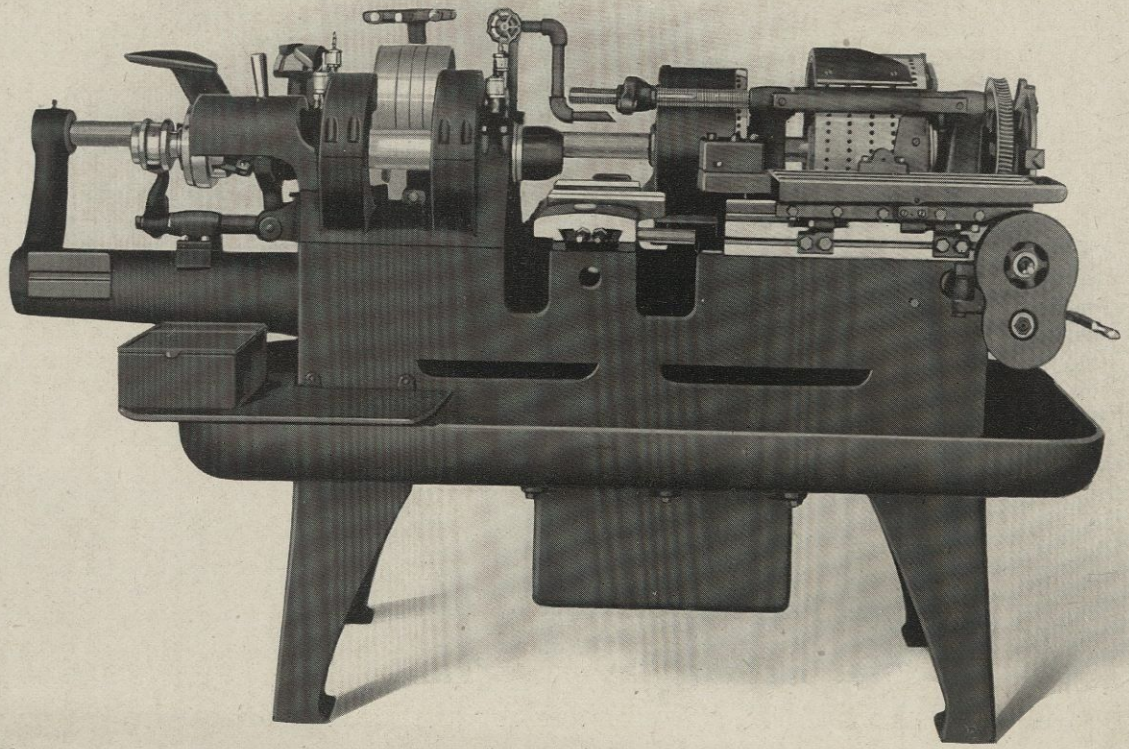
	Code
Magazine (Vertical)	*Ledger*
Third Spindle Speed	*Obduce*
Thread Rolling	*Dothanme*
Independent Cut-off	*Mobileme*
High Speed Drilling, Counterboring and Reaming	*Galenic*
Double Cross Slides	*Cacolet*
Cross Slide Centering, Drilling, Reaming and Tapping	*Monitme*
Cross Slide Taper Turning	*Globeme*
Necking	*Eurekame*

FLOOR SPACE 54x92 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	161.7
Net Weight of Machine with Countershaft	3580 lbs.

In designing the CLEVELAND, it has been our aim to eliminate the human element in operating.



1¼-1½ Inch Plain Full Automatic Machine—Model B

MODEL B

1 1/4—1 1/2 Inch Plain Full Automatic Machine

CODE—ARTFUL

RANGE:

Chuck Capacity	1½ in.
Length of Stock Feed	7½ in.
Milling Length	7½ in.
End of Milling Slide to Face of Chuck—Minimum	3 in.
End of Milling Slide to Face of Chuck—Maximum	15½ in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	91
Speeds, R. P. M.—Maximum	405

DRIVE:

Belt Widths—Spindle	2 in.
Belt Widths—Feed	1½ in.
Motor Drive, H. P. Required	3
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.	462, 390, 330

STANDARD ATTACHMENTS:

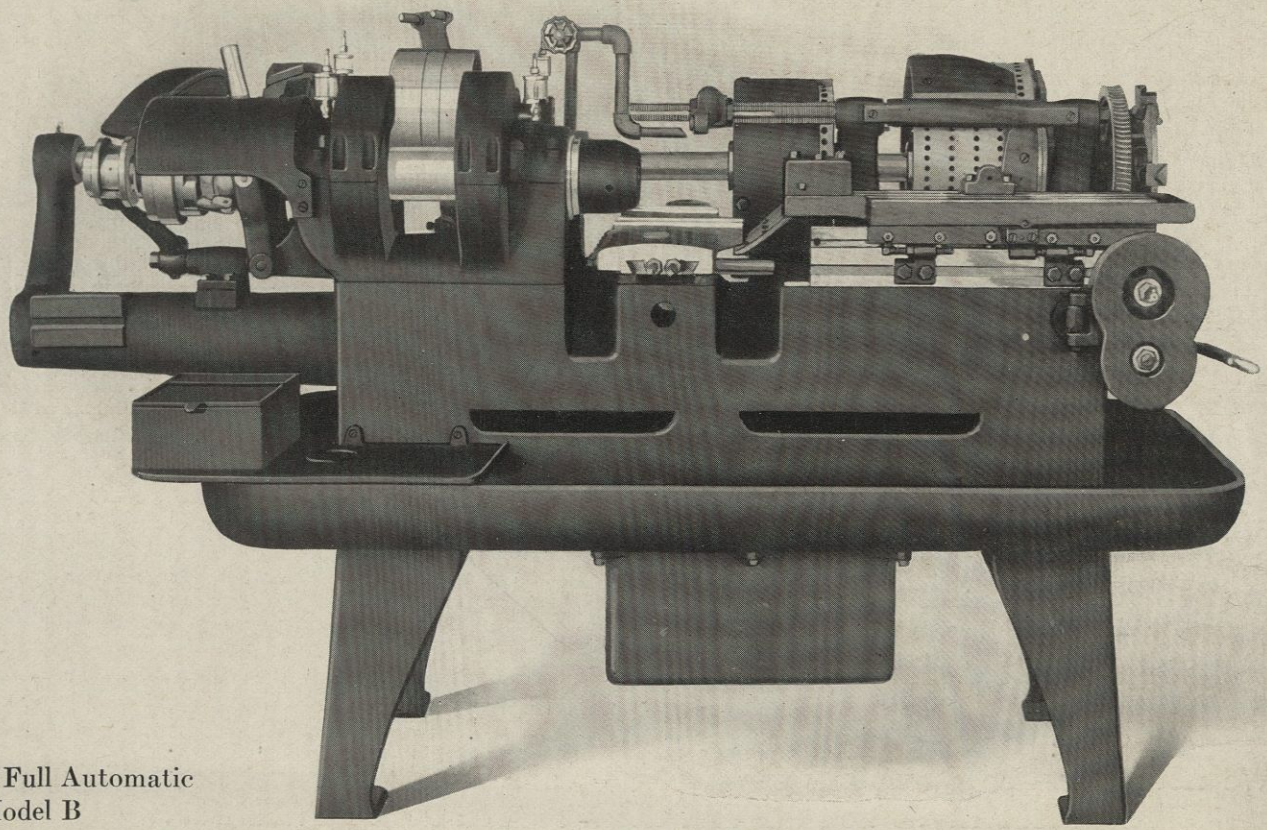
	Code
Magazine (Vertical)	*Ledger*
Third Spindle Speed	*Obdate*
Thread Rolling	*Dothancal*
Independent Cut-off	*Mobilecal*
High Speed Drilling, Counterboring and Reaming	*Galenic*
Double Cross Slides	*Cacolet*
Cross Slide Centering, Drilling, Reaming and Tapping	*Minotcal*
Cross Slide Taper Turning	*Globecal*
Necking	*Eurekacal*

FLOOR SPACE 54x92 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	161. 7
Net Weight of Machine with Countershaft	3642 lbs.

We never sacrifice durability for neatness, and we never sacrifice neatness for durability. You will find them both in the CLEVELAND.



2 Inch Plain Full Automatic
Machine—Model B

MODEL B

2 Inch Plain Full Automatic Machine

CODE—ARTLESS

RANGE:

Chuck Capacity	2	in.
Length of Stock Feed	7½	in.
Milling Length	7½	in.
End of Milling Slide to Face of Chuck — Minimum	3	in.
End of Milling Slide to Face of Chuck — Maximum	15½	in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	2⅝	in.

SPINDLE SPEEDS:

Number of Changes	6	
Speeds, R. P. M. — Minimum	91	
Speeds, R. P. M. — Maximum	319	

DRIVE:

Belt Widths — Spindle	2	in.
Belt Widths — Feed	1½	in.
Motor Drive, H. P. Required	4	
Step Diameters of Cones on Countershaft and Width of Face	10, 11 and 12x4⅛	in.
Speeds of Countershaft, R. P. M.	450, 390, 341	

STANDARD ATTACHMENTS:

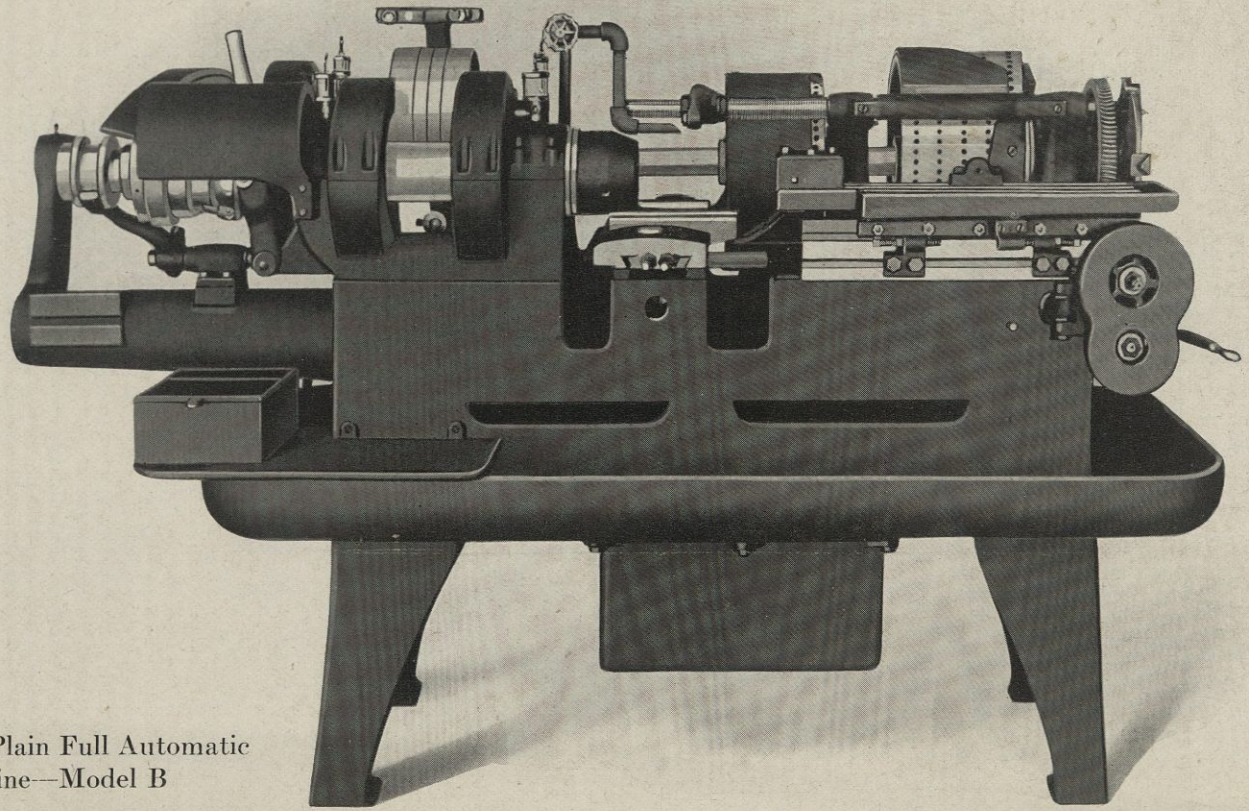
	Code
Magazine (Vertical)	*Lofty*
Air Chucking for Piston Machine	*Airwis*
Third Spindle Speed	*Obduction*
Thread Rolling	*Dothanwis*
Independent Cut-off	*Mobilewis*
High Speed Drilling, Counterboring and Reaming	*Galenic*
Double Cross Slides	*Cacolet*
Cross Slide Centering, Drilling, Reaming and Tapping	*Minotwis*
Cross Slide Taper Turning	*Globewis*
Necking	*Eurekawis*

FLOOR SPACE 54x92 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425	lbs.
Foreign Shipment—Box Weight	740	lbs.
Cubic Feet Boxed for Foreign Shipment	161.7	
Net Weight of Machine with Countershaft	3742	lbs.

In the CLEVELAND you will find a machine as evenly balanced as the speed of a race horse.



2-2½ Inch Plain Full Automatic Machine—Model B

MODEL B

2—2 1/2 Inch Plain Full Automatic Machine

CODE—ARTLESSLY

RANGE:

Chuck Capacity	2½ in.
Length of Stock Feed	7½ in.
Milling Length	7½ in.
End of Milling Slide to Face of Chuck—Minimum	3 in.
End of Milling Slide to Face of Chuck—Maximum	15½ in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	91
Speeds, R. P. M.—Maximum	319

DRIVE:

Belt Widths—Spindle	2 in.
Belt Widths—Feed	1½ in.
Motor Drive, H. P. Required	4
Step Diameters of Cones on Countershaft and Width of Face	10, 11 and 12x4⅛ in.
Speeds of Countershaft, R. P. M.	450, 390, 341

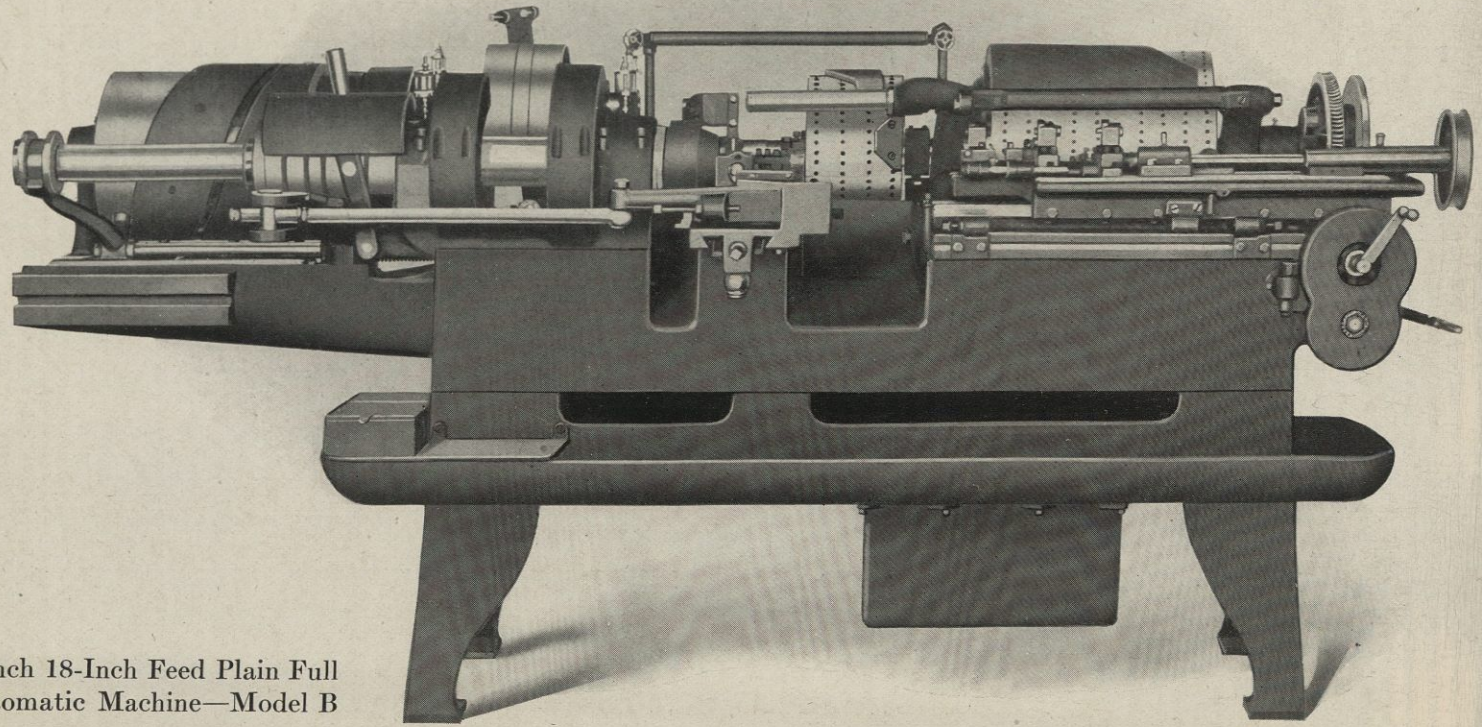
STANDARD ATTACHMENTS:	Code
Magazine (Vertical)	*Lofty*
Third Spindle Speed	*Obduction*
Thread Rolling	*Dothannj*
Independent Cut-off	*Mobilenj*
High Speed Drilling, Counterboring and Reaming	*Galenic*
Double Cross Slides	*Cacolet*
Cross Slide Centering, Drilling, Reaming and Tapping	*Minotnj*
Cross Slide Taper Turning	*Globenj*
Necking	*Eurekanj*

FLOOR SPACE 54x92 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	161.7
Net Weight of Machine with Countershaft	3742 lbs.

It is an easy matter to spend a considerable amount of money foolishly. When you purchase CLEVELANDS, have no fear of such a blunder.



2 Inch 18-Inch Feed Plain Full Automatic Machine—Model B

MODEL B

2 Inch, 18 Inch Feed, Plain Full Automatic Machine

CODE—AMPLY

RANGE:

Chuck Capacity	2	in.
Length of Stock Feed	18	in.
Milling Length	16	in.
End of Milling Slide to Face of Chuck — Minimum	0	
End of Milling Slide to Face of Chuck — Maximum	23 7/16	in.

CROSS SLIDE:

Height from Top of Cross Slide to Center of Spindle	3½	in.

SPINDLE SPEEDS:

Number of Changes	6	
Speeds, R. P. M. — Minimum	91	
Speeds, R. P. M. — Maximum	319	

DRIVE:

Belt Widths — Spindle	2	in.
Belt Widths — Feed	1½	in.
Motor Drive, H. P. Required	5	
Step Diameters of Cones on Countershaft and Width of Face	10, 11 and 12x4⅛	in.
Speeds of Countershaft, R. P. M.	450, 390, 341	

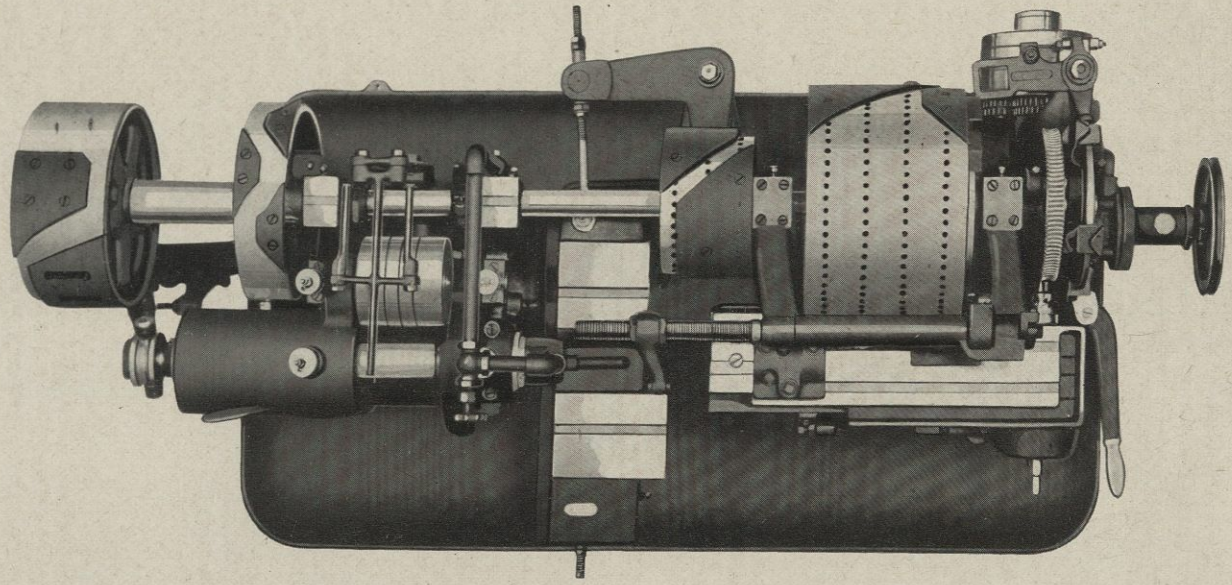
STANDARD ATTACHMENTS:	**Code**
Magazine (Vertical)	*Luster*
Third Spindle Speed	*Obduction*
Thread Rolling	*Dothanwis*
Independent Cut-off	*Mobilewis*
High Speed Drilling, Counterboring and Reaming	*Galatea*
Double Cross Slides	*Cackle*
Cross Slide Centering, Drilling, Reaming and Tapping	*Minotwis*
Cross Slide Taper Turning	*Globewis*
Necking	*Eurekawis*

FLOOR SPACE 54x120 in.

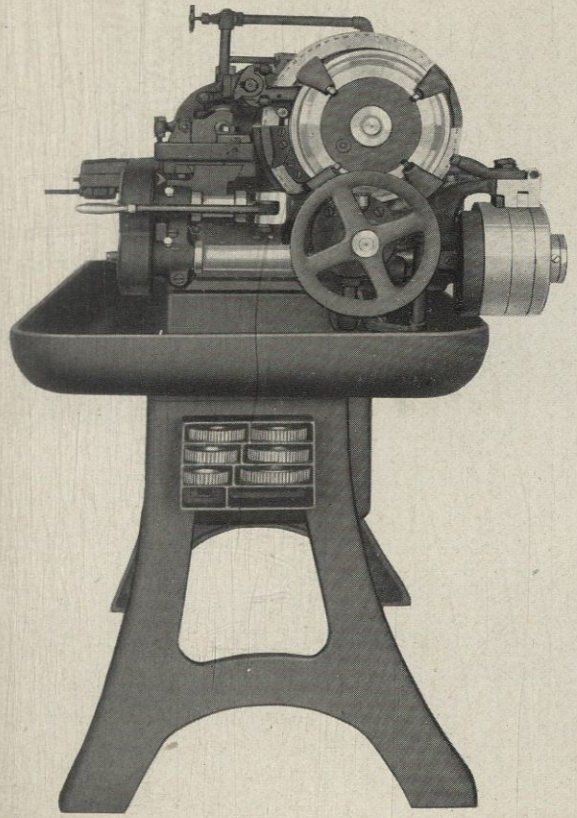
SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425	lbs.
Foreign Shipment—Box Weight	740	lbs.
Cubic Feet Boxed for Foreign Shipment	203	
Net Weight of Machine with Countershaft	4759	lbs.

A CLEVELAND is a great diplomat. Its silent argument is its great producing quality.

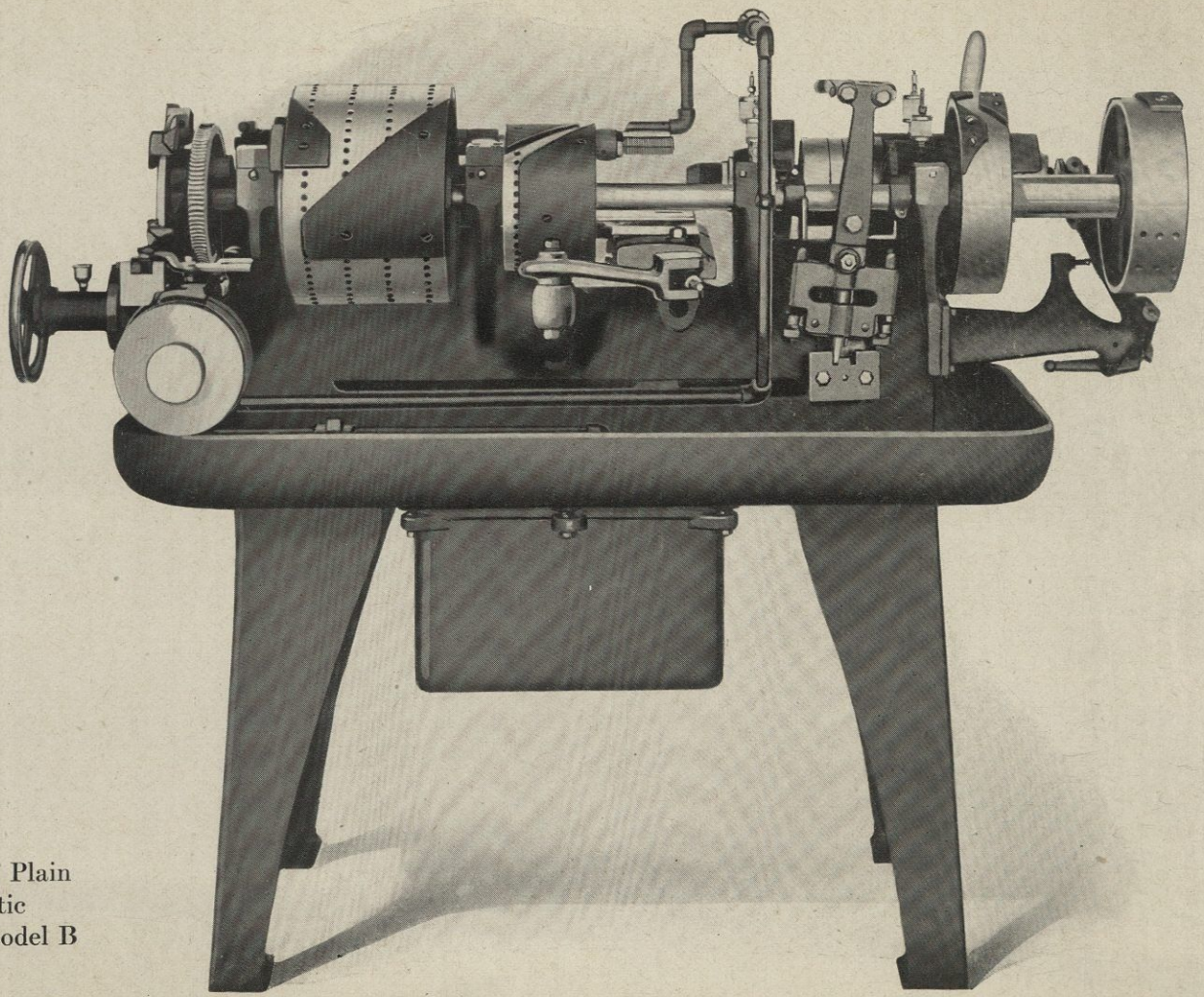


Top View of Plain Full Automatic Machine—Model B



Model B—End View

Showing end view of our Model B machines. The figures shown on the side of drum are for the location of cams. When a set of cams are located correctly for any job, all that is necessary is to mark the cam in line with any of these figures and in setting up in the future it simplifies matters by placing the cam in the position in which it was originally used. The dogs shown on the disc can be adjusted very rapidly to any position to shift the belt from high to low speed and vice versa. The lever at the left controls the feed clutch engaging or disengaging the power feed.



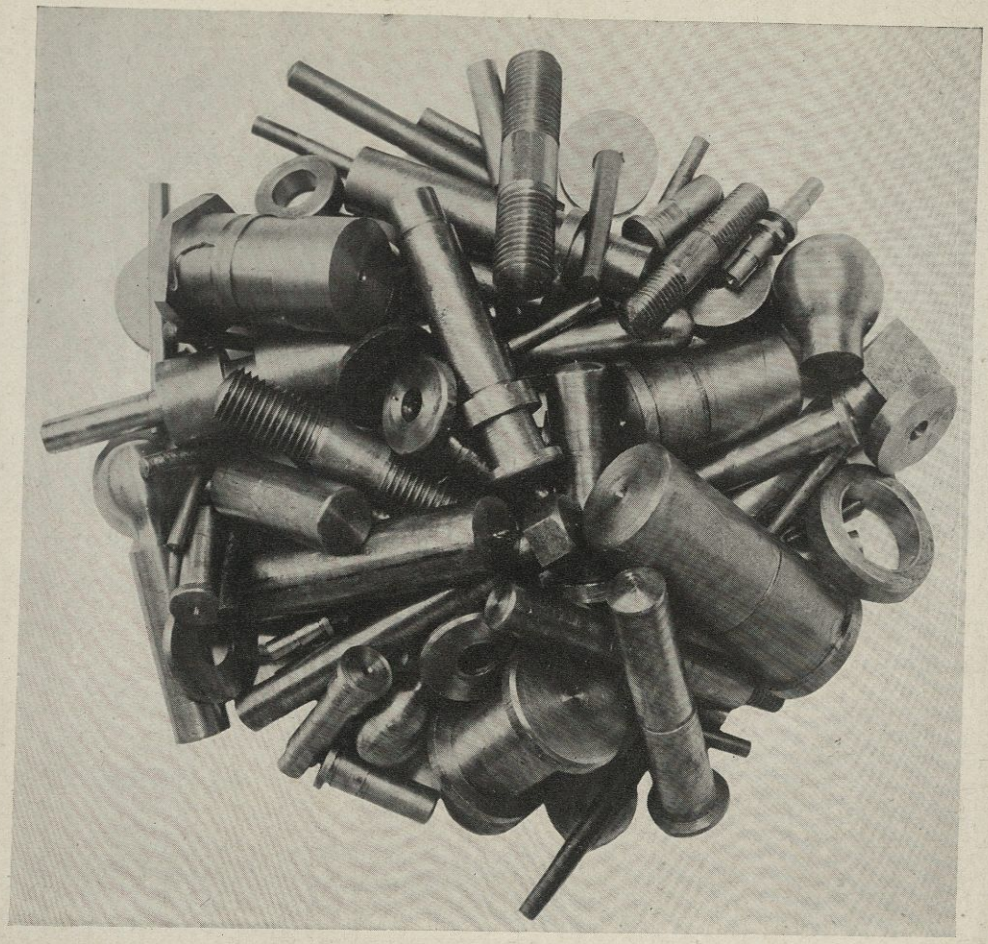
Rear View of Plain
Full Automatic
Machine—Model B

Rear View of Model B

Here we show a rear view of our Model B machine, and the one thing to which we wish to call your attention is the simplicity of design and the accessibility to all working parts. The spindle head, belt shifter and the adjustment of the cross slide and tool feed are all within easy reach from the rear of the machine. A CLEVELAND is different in this respect from nearly all the other automatics. All the mechanism on a CLEVELAND Automatic is visible, which means it is accessible without taking the machine apart in any way to make adjustments.

The rod that controls the stock feed and the stock feed segment are in a convenient location.

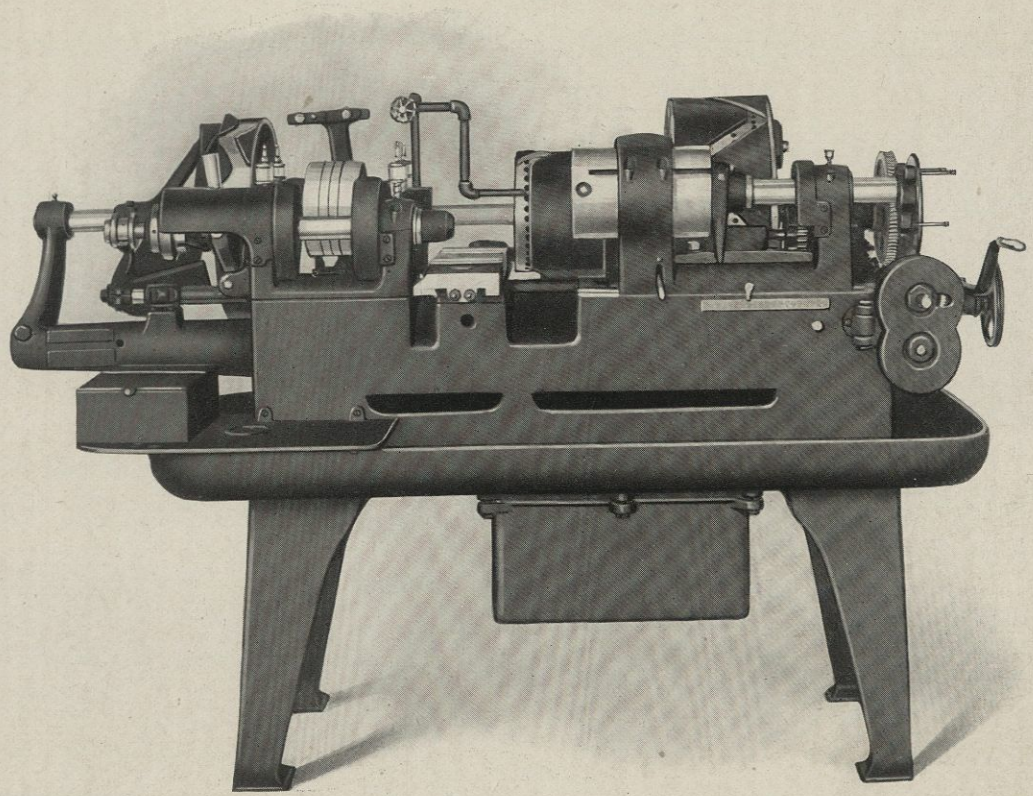
The points we are bringing out are important from an operator's standpoint, as there is no waste of time in making any of the adjustments above mentioned.



Work Produced on
Plain Full Automatic
Machines—Model B

Work Produced on Model B Machines

We show here an interesting group of parts produced on our simplest machine, a Model B. This is the easiest machine on the market to operate and for anything within its range it is one of the most rapid machines that can be purchased. Considering that this machine has no turret, we produce many pieces on it with a number of operations, and if you will look closely at these samples, you will realize what this explanation means. We have thousands of these machines in use all over the country.



7/8 Inch Three Hole Turret Full Automatic Machine—Model C

MODEL C

7/8 Inch Three Hole Turret Full Automatic Machine

CODE—AXIAL

RANGE:

Chuck Capacity	7/8 in.
Length of Stock Feed	8 in.
Milling Length	6¾ in.
Longitudinal Adjustment of Turret Head on Bed	6⅝ in.
Turret Face to Face of Chuck—Minimum	3 1/16 in.
Turret Face to Face of Chuck—Maximum	9 11/16 in.

TURRET AND CROSS SLIDE:

Diameter of Turret Holes	1¼ in.
Height from Center of Spindle to Top of Cross Slide	2⅜ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M.—Minimum	241
Speeds, R. P. M.—Maximum	934

DRIVE:

Belt Widths—Spindle	1½ in.
Belt Widths—Feed	1¼ in.
Motor Drive, H. P. Required	2½
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x 3⅛ in.
Speeds of Countershaft, R. P. M.	533, 450, 385

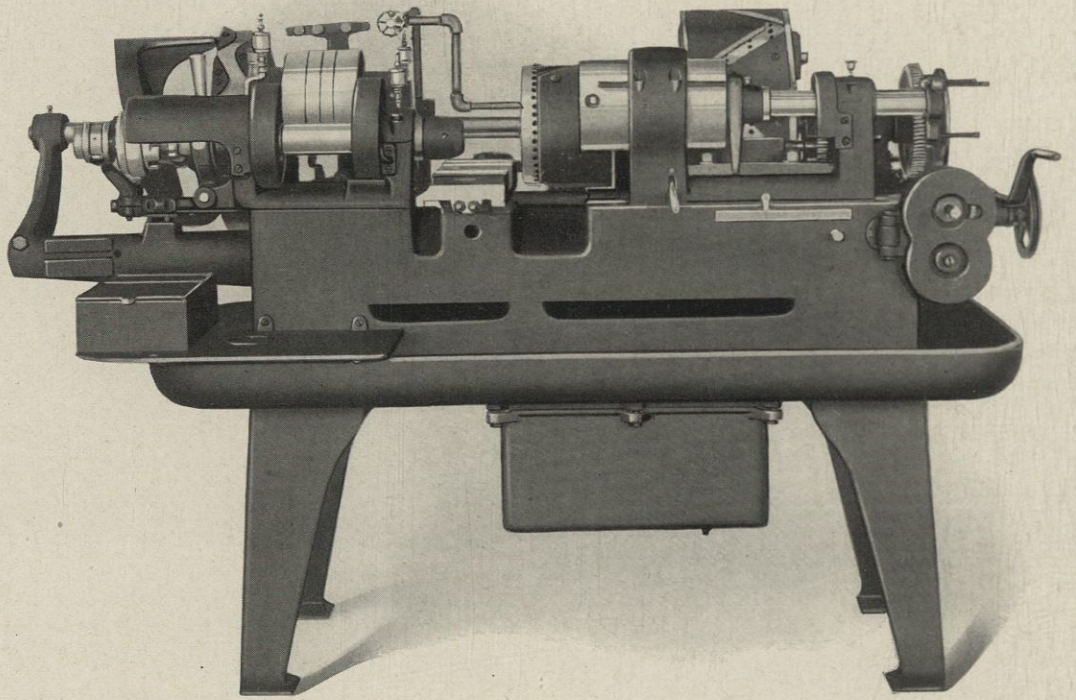
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Lackey*
Air Chucking	*Airmd*
Third Spindle Speed	*Oastey*
Thread Rolling	*Dothanmd*
Independent Cut-off	*Mobilemd*
High Speed Drilling, Reaming and Counterboring	*Gaudy*
Double Cross Slides	*Cactus*
Oil Feed through Turret	*Oil*
Turret Turning	*Reveremd*

FLOOR SPACE 45x90 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	329 lbs.
Foreign Shipment—Box Weight	606 lbs.
Cubic Feet Boxed for Foreign Shipment	161.7
Net Weight of Machine with Countershaft	3401 lbs.

In all lines of business everyone is aiming to earn as much as possible. The use of CLEVELAND Automatics will relieve the tension in this respect.



7/8-1 1/4 Inch Three Hole Turret Full Automatic Machine—Model C

MODEL C

7/8—1 1/4 Inch Three Hole Turret Full Automatic Machine

CODE—AXIMITE

RANGE:

Chuck Capacity	1¼ in.
Length of Stock Feed	8 in.
Milling Length	6¾ in.
Longitudinal Adjustment of Turret Head on Bed	6⅝ in.
Turret Face to Face of Chuck Minimum	2 9/16 in.
Turret Face to Face of Chuck Maximum	9 3/16 in.

TURRET AND CROSS SLIDE:

Diameter of Turret Holes	1¼ in.
Height from Center of Spindle to Top of Cross Slide	2⅜ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M. Minimum	152
Speeds, R. P. M. Maximum	725

DRIVE:

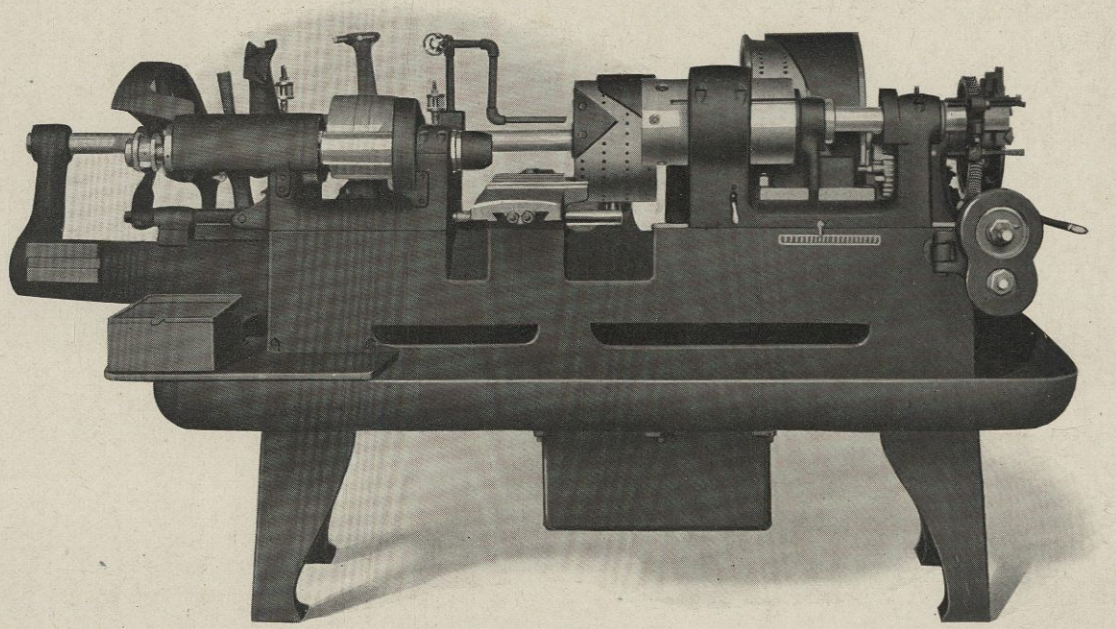
Belt Widths Spindle	2 in.
Belt Widths Feed	1¼ in.
Motor Drive, H. P. Required	2½
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.	533, 450, 385

	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Lackey*
Air Chucking	*Airkan*
Third Spindle Speed	*Oastile*
Thread Rolling	*Dothankan*
Independent Cut-off	*Mobilekan*
High Speed Drilling, Reaming and Counterboring	*Gaudy*
Double Cross Slides	*Cactus*
Oil Feed through Turret	*Oil*
Turret Turning	*Reverekan*
FLOOR SPACE	45x90 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	329 lbs.
Foreign Shipment—Box Weight	606 lbs.
Cubic Feet Boxed for Foreign Shipment	161.7
Net Weight of Machine with Countershaft	3451 lbs.

Let us help you solve the problems of rising costs with the aid of CLEVELAND Automatics.



1¼ Inch Three Hole Turret Full Automatic Machine—Model C

MODEL C

1 1/4 Inch Three Hole Turret Full Automatic Machine

CODE—AXLINE

RANGE:

Chuck Capacity	1¼ in.
Length of Stock Feed	8¼ in.
Milling Length	8 in.
Longitudinal Adjustment of Turret Head on Bed	5⅞ in.
Turret Face to Face of Chuck, Minimum	6¼ in.
Turret Face to Face of Chuck, Maximum	12⅛ in.

TURRET AND CROSS SLIDE:

Diameter of Turret Holes	1½ in.
Height from Center of Spindle to Top of Cross Slide	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	129
Speeds, R. P. M., Maximum	629

DRIVE:

Belt Widths, Spindle	2 in.
Belt Widths, Feed	1½ in.
Motor Drive, H. P. Required	3
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.	462, 390, 330

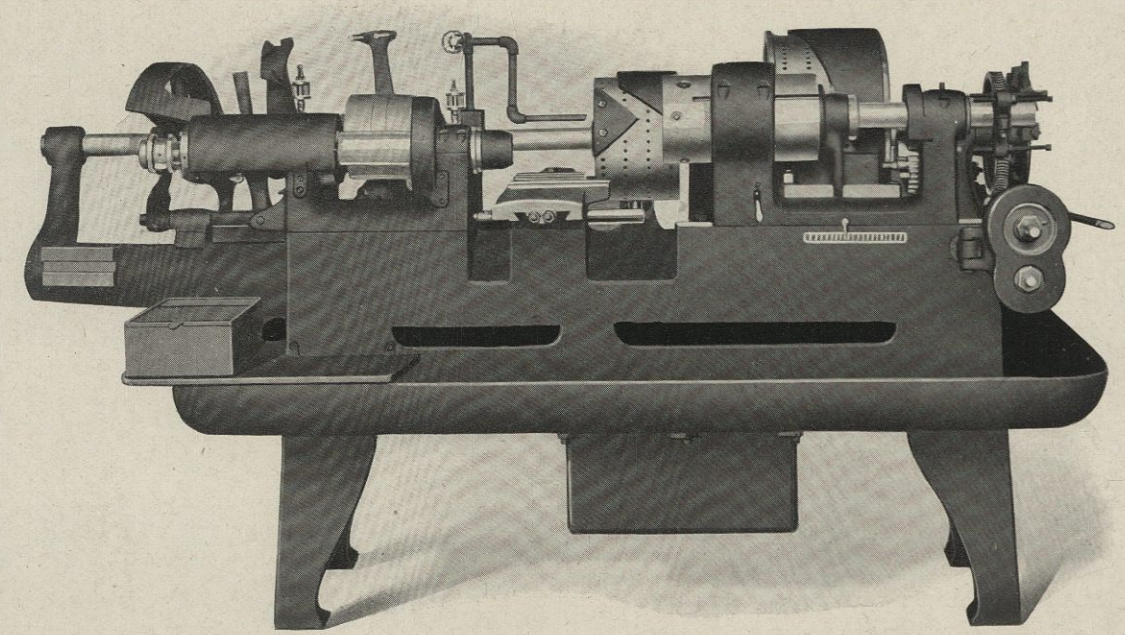
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Lactate*
Air Chucking	*Airme*
Third Spindle Speed	*Oastus*
Thread Rolling	*Dothanme*
Independent Cut-off	*Mobileme*
High Speed Drilling, Reaming and Counterboring	*Gauge*
Double Cross Slides	*Caddies*
Oil Feed through Turret	*Oil*
Turret Turning	*Revereme*

FLOOR SPACE 54x102 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	3967 lbs.

We claim up-to-dateness; never-ceasing vigilance is necessary to keep to the front.



1¼-1½ Inch Three Hole Turret Full Automatic Machine—Model C

MODEL C

1 1/4–1 1/2 Inch Three Hole Turret Full Automatic Machine

CODE—AXLIS

RANGE:

Chuck Capacity	1½ in.
Length of Stock Feed	8¼ in.
Milling Length	8 in.
Longitudinal Adjustment of Turret Head on Bed	5⅞ in.
Turret Face to Face of Chuck, Minimum	6¼ in.
Turret Face to Face of Chuck, Maximum	12⅛ in.

TURRET AND CROSS SLIDE:

Diameter of Turret Holes	1½ in.
Height from Center of Spindle to Top of Cross Slide	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	91
Speeds, R. P. M., Maximum	405

DRIVE:

Belt Widths, Spindle	2 in.
Belt Widths, Feed	1½ in.
Motor Drive, H. P. Required	3
Step Diameters of Cones on Countershaft and Width of Face	8, 9 and 10x3⅛ in.
Speeds of Countershaft, R. P. M.	462, 390, 330

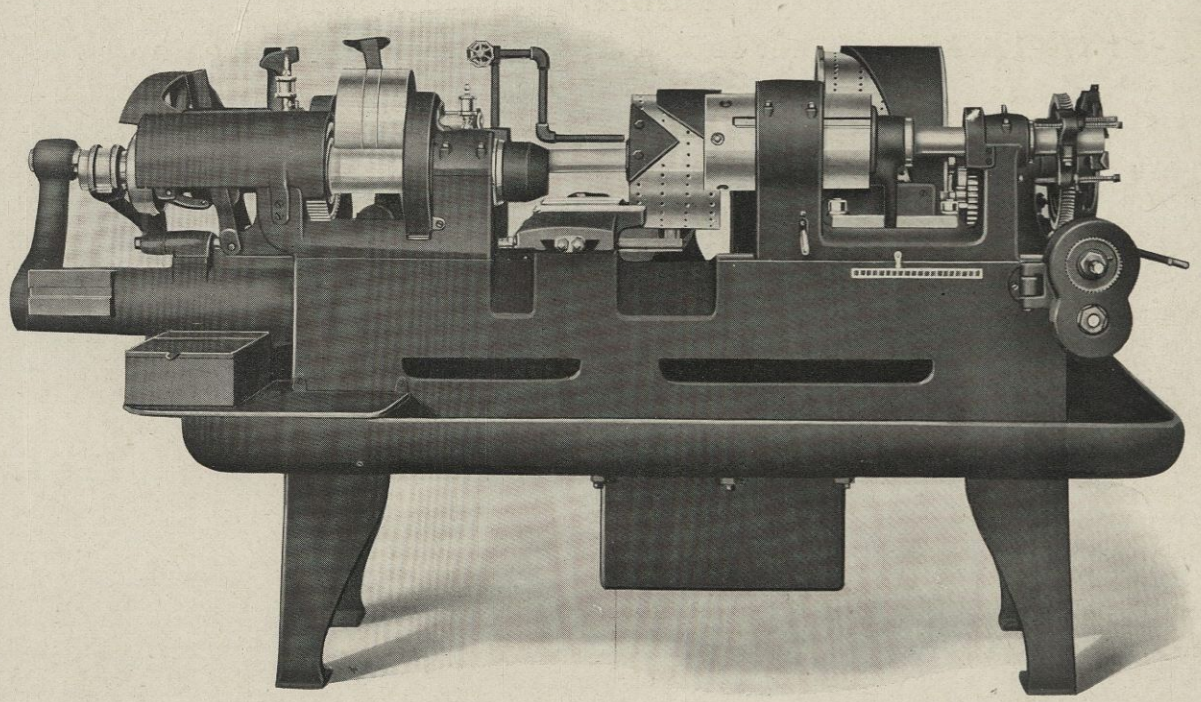
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Lactate*
Air Chucking	*Aircal*
Third Spindle Speed	*Oastave*
Thread Rolling	*Dothancal*
Independent Cut-off	*Mobilecal*
High Speed Drilling, Reaming and Counterboring	*Gauge*
Double Cross Slides	*Caddies*
Oil Feed through Turret	*Oil*
Turret Turning	*Reverecal*

FLOOR SPACE 54x102 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	4029 lbs.

It is senseless to purchase a full turret automatic when the simplest kind is more efficient. We have both kinds.



2 Inch Three Hole Turret Full Automatic Machine—Model C

MODEL C

2 Inch Three Hole Turret Full Automatic Machine

CODE—AXLE

RANGE:

Chuck Capacity	2	in.
Length of Stock Feed	8¼	in.
Milling Length	8	in.
Longitudinal Adjustment of Turret Head on Bed	5⅞	in.
Turret Face to Face of Chuck — Minimum	5¼	in.
Turret Face to Face of Chuck — Maximum	11⅛	in.

TURRET AND CROSS SLIDE:

Diameter of Turret Holes	1½	in.
Height from Center of Spindle to Top of Cross Slide	2⅝	in.

SPINDLE SPEEDS:

Number of Changes	6	
Speeds, R. P. M. — Minimum	91	
Speeds, R. P. M. — Maximum	319	

DRIVE:

Belt Widths — Spindle	2	in.
Belt Widths — Feed	1½	in.
Motor Drive, H. P. Required	4	
Step Diameters of Cones on Countershaft and Width of Face	10, 11 and 12x4⅛	in.
Speeds of Countershaft, R. P. M.	450, 390, 341	

STANDARD ATTACHMENTS:

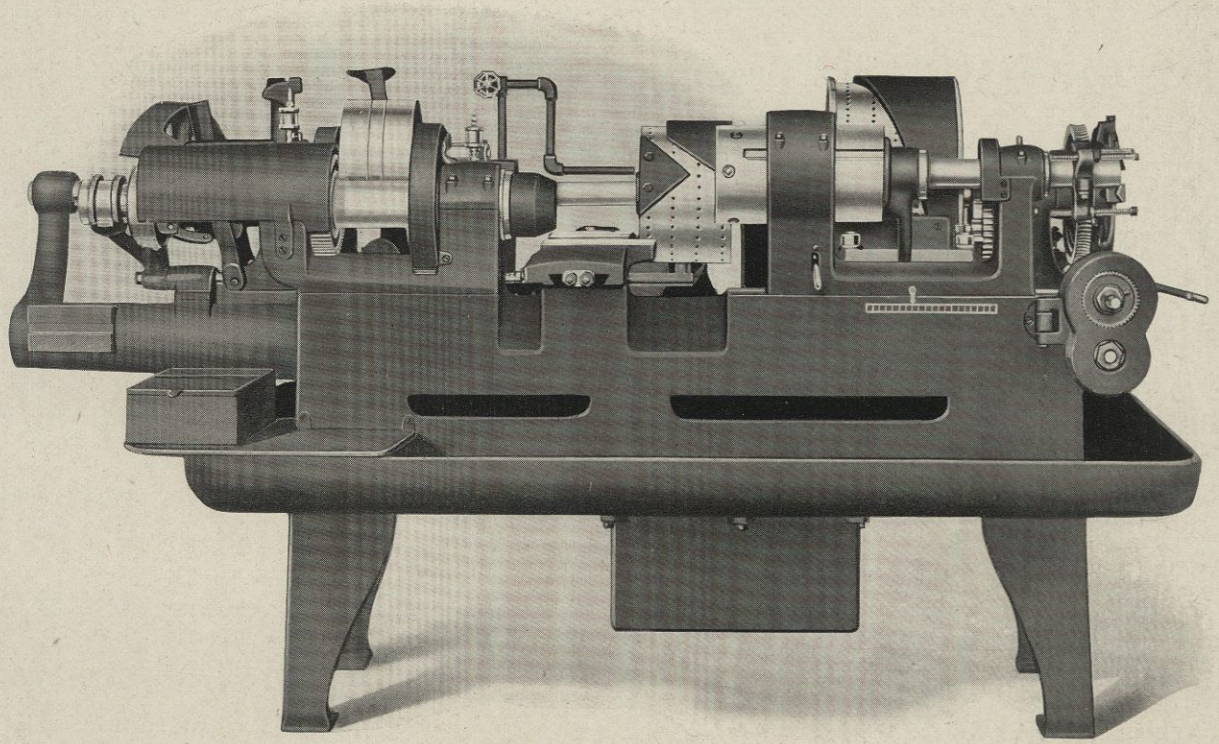
	Code
Magazine (Rotary Tilting)	*Lactide*
Air Chucking	*Airwis*
Third Spindle Speed	*Oastling*
Thread Rolling	*Dothanwis*
Independent Cut-off	*Mobilewis*
High Speed Drilling, Reaming and Counterboring	*Gauger*
Double Cross Slides	*Caddy*
Oil Feed through Turret	*Oil*
Turret Turning	*Reverewis*

FLOOR SPACE 54x102 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	4126 lbs.

Incomparable range in every respect is one of our superior talking points.



2-2½ Inch Three Hole Turret Full Automatic Machine—Model C

MODEL C

2—2 1/2 Inch Three Hole Turret Full Automatic Machine

CODE—ALEXIS

RANGE:

Chuck Capacity	2½ in.
Length of Stock Feed	8¼ in.
Milling Length	8 in.
Longitudinal Adjustment of Turret Head on Bed	5⅞ in.
Turret Face to Face of Chuck, Minimum	5¼ in.
Turret Face to Face of Chuck, Maximum	11⅛ in.

TURRET AND CROSS SLIDE:

Diameter of Turret Holes	1½ in.
Height from Center of Spindle to Top of Cross Slide	2⅝ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M., Minimum	91
Speeds, R. P. M., Maximum	319

DRIVE:

Belt Widths, Spindle	2 in.
Belt Widths, Feed	1½ in.
Motor Drive, H. P. Required	4
Step Diameters of Cone on Countershaft and Width of Face	10, 11 and 12x4⅛ in.
Speeds of Countershaft, R. P. M.	450, 390, 341

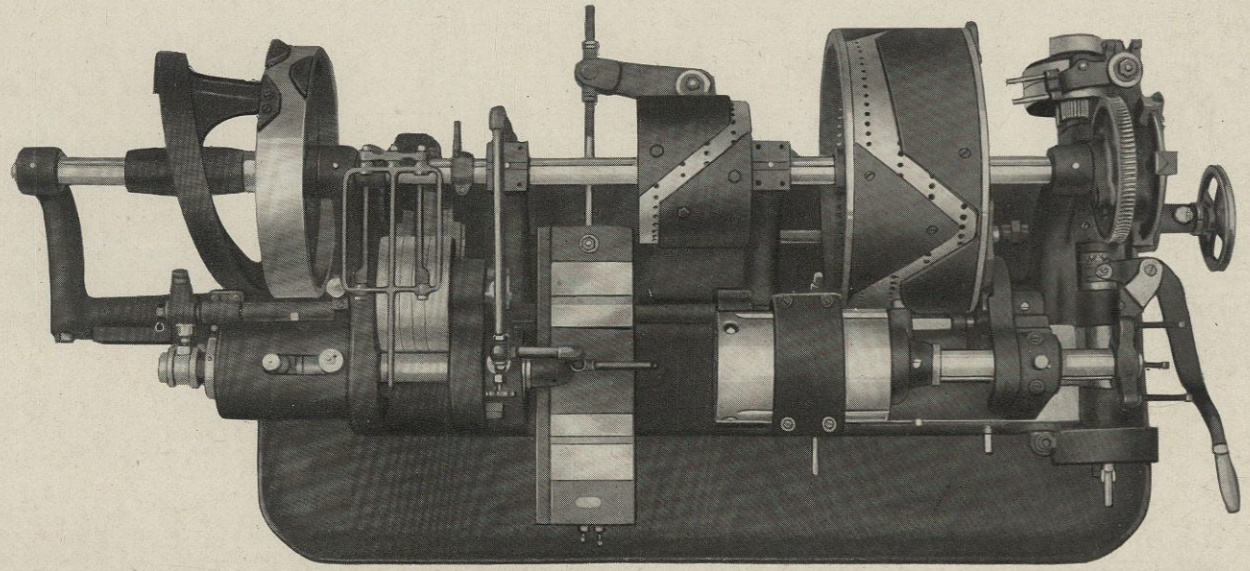
	Code
STANDARD ATTACHMENTS:	
Magazine (Rotary Tilting)	*Lactide*
Air Chucking	*Airnj*
Third Spindle Speed	*Oastling*
Thread Rolling	*Dothannj*
Independent Cut-off	*Mobilenj*
High Speed Drilling, Reaming and Counterboring	*Gauger*
Double Cross Slides	*Caddy*
Oil Feed through Turret	*Oil*

FLOOR SPACE 54x102 in.

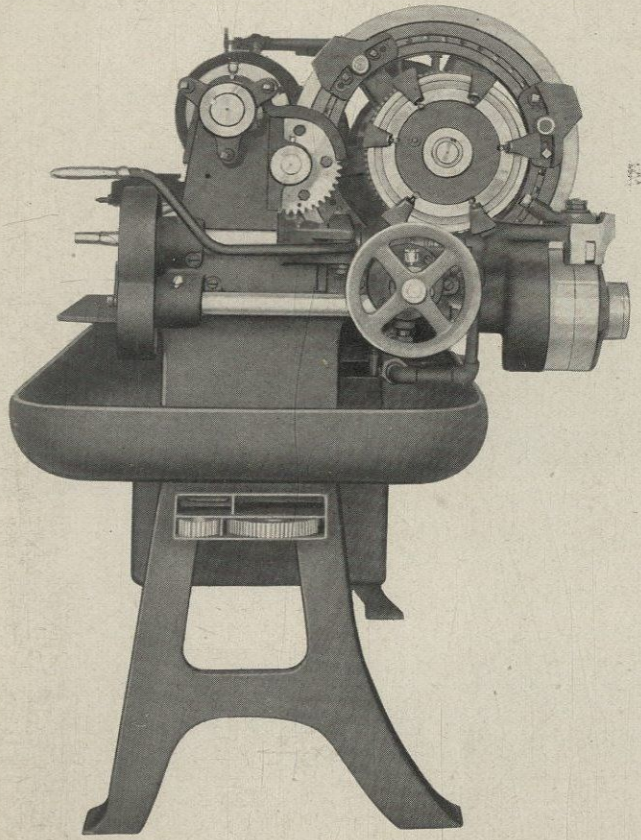
SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	425 lbs.
Foreign Shipment—Box Weight	740 lbs.
Cubic Feet Boxed for Foreign Shipment	203
Net Weight of Machine with Countershaft	4126 lbs.

By using CLEVELANDS the uncertainty of human skill has been done away with.

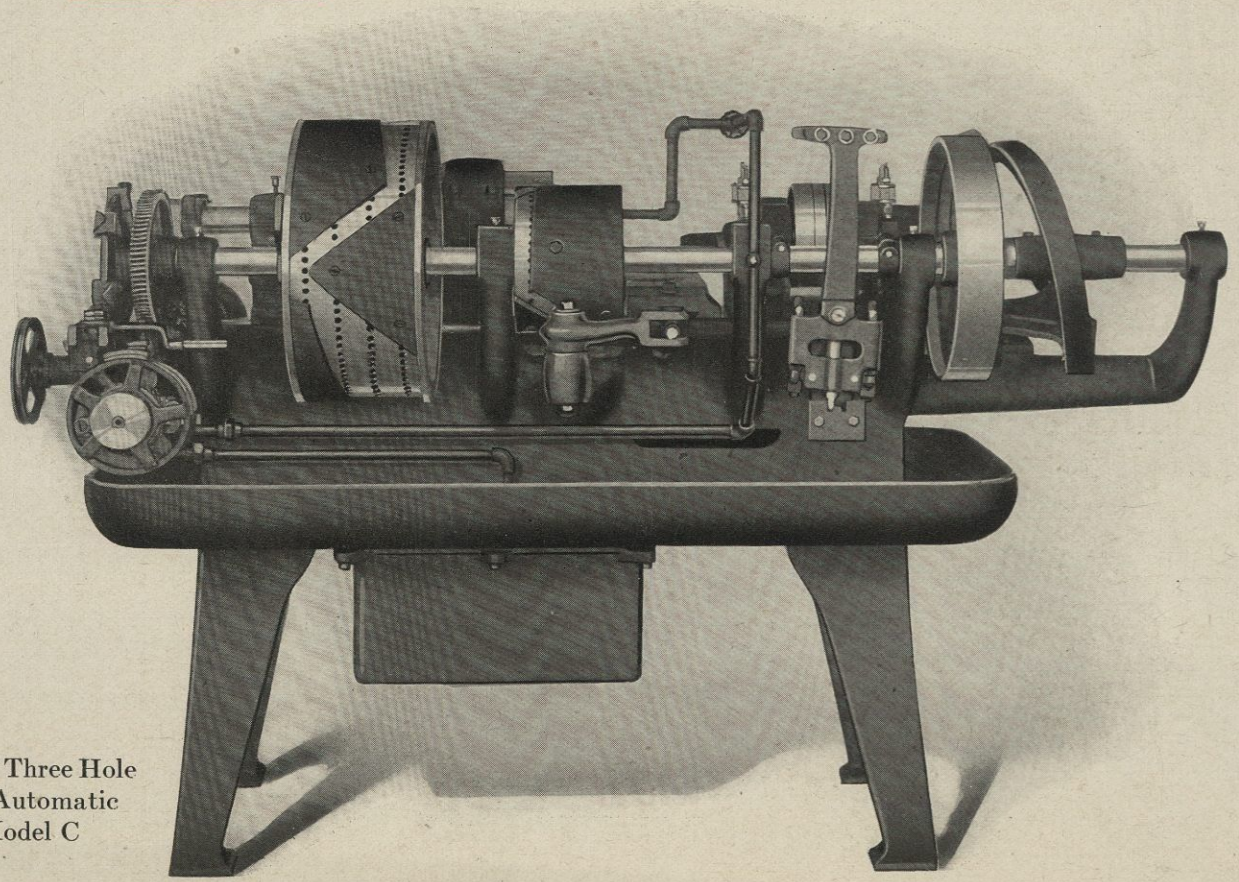


Top View of Three Hole Turret Full Automatic Machine—Model C



Model C—End View

This is an end view of our Model C machine. The lever at the left is used for disconnecting the feed or starting the machine, similar to our Model B. The cams on the discs and drums are easily adjusted and located in position. One set of cams on the large drum are intended for indexing the turret. The turret on this machine can be indexed any time desired. The better explanation is that the turret can be advanced say 6 inches and returned to its original position and then advanced 2 inches and returned to its original position. The small cams on the disc are intended to move the belt from high to low and vice versa.



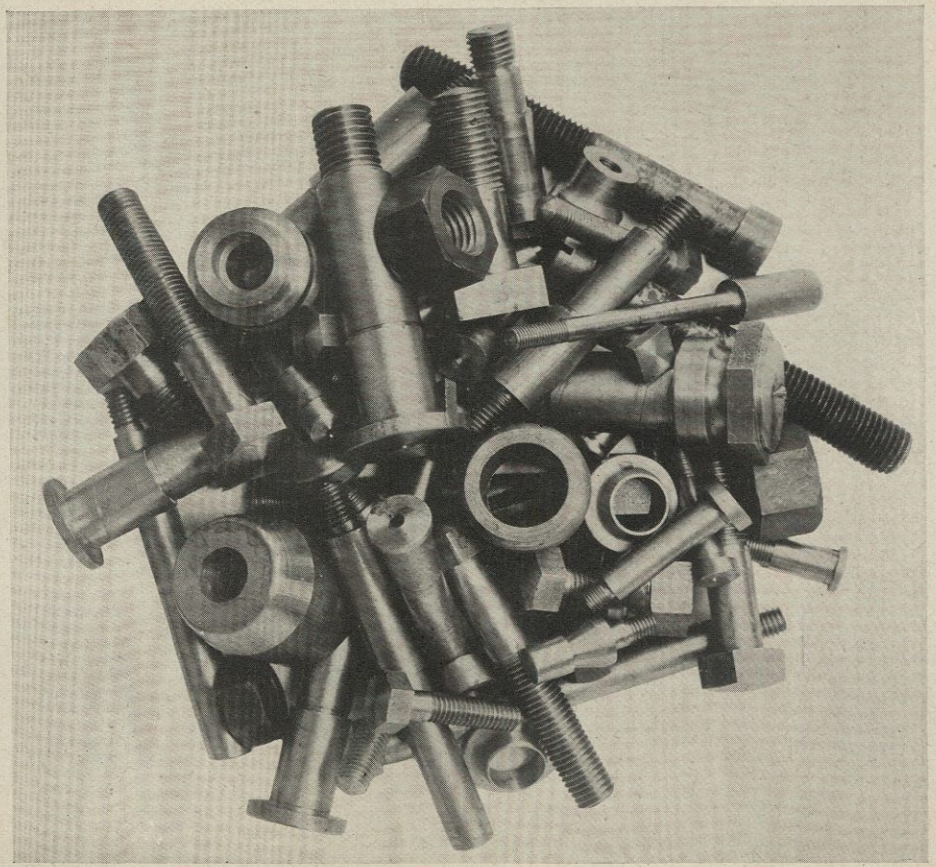
Rear View of Three Hole Turret Full Automatic Machine—Model C

Rear View of Model C

Here we show a rear view of our Model C machine, and the one thing to which we wish to call your attention is the simplicity of design and the accessibility to all working parts. The spindle head, belt shifter and the adjustment of the cross slide and tool feed are all within easy reach from the rear of the machine. A CLEVELAND is different in this respect from nearly all the other automatics. All the mechanism on a CLEVELAND Automatic is visible, which means it is accessible without taking the machine apart in any way to make adjustments.

The rod that controls the stock feed and the stock feed segment is in a convenient position.

The points we are bringing out are important from an operator's standpoint, as there is no waste of time in making any of the adjustments above mentioned.

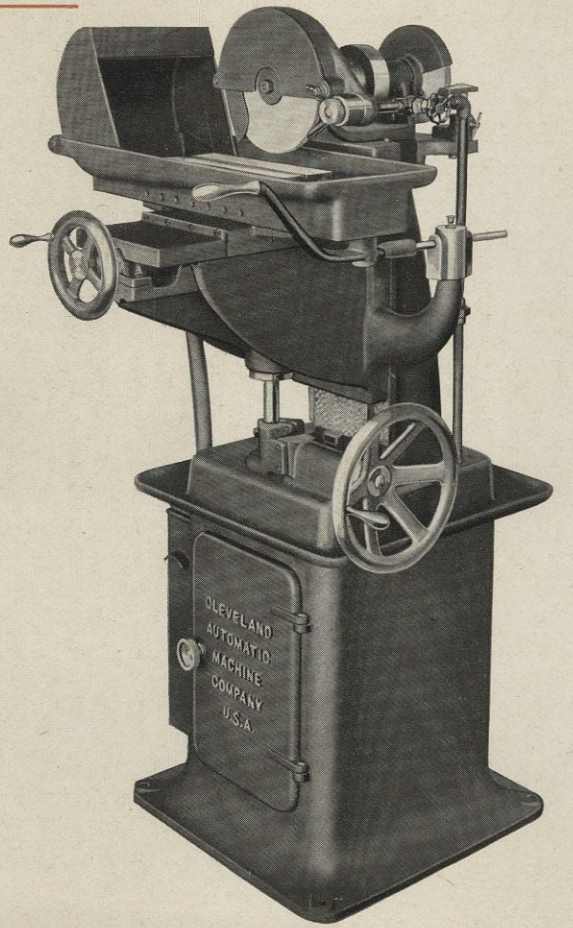


Work Produced on
Three Hole Turret Full
Automatic Machines
—Model C

Work Produced on Model C Machines

This nest of samples will give you some idea of what we are capable of doing on our Model C machines. These machines are three-hole turret automatics and designed to produce a vast amount of different shaped pieces exceptionally rapid, especially when the pieces do not require too many operations.

We manufacture automatics, as you will see from this catalog, with five holes in the turret, but very often there is a great amount of work that does not require this five-hole machine, so use a Model C in these cases, which is half way between our Model B and Model A automatic machine.



The "Cleveland" Tool and Surface Grinder—Model EE

MODEL EE

The "Cleveland" Tool and Surface Grinder

CODE—WETGRIND

This machine is designed to be used in connection with groups of "Cleveland" Automatics, for grinding the cross slide tools. The use of this grinder insures accuracy in grinding tools, which is important in order to obtain good work from any machine. This grinder is also very useful for any class of small surface work such as found in the tool room.

Great care is exercised in the manufacture of this machine, the workmanship being equal to that on our automatic machines.

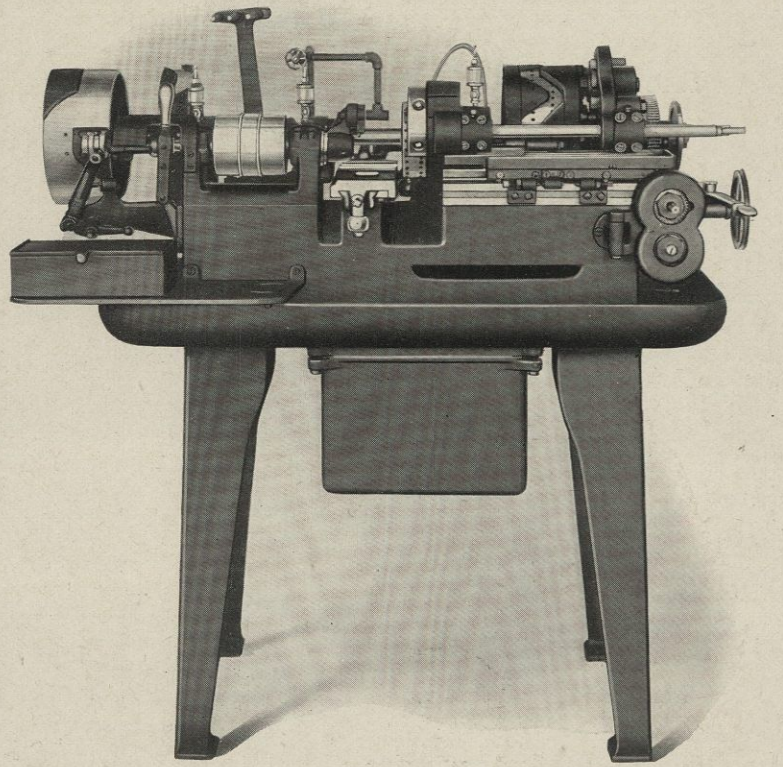
The Wheel Spindle is ground and runs in high grade phosphor bronze, these bearings being dust-proof.

The spindle carries two wheels, the one in front being used for surface grinding. The rear wheel is for ordinary tool grinding, such as lathe tools, etc.

Front Wheel	Diameter 8″	Face 3/8″
Rear Wheel	Diameter 6″	Face 3/4″

Distance from center of spindle to top of slide when knee is at lowest position	8″
Distance from center of spindle to top of slide when knee is at highest position	2″
Height of spindle from floor	49½″
Longitudinal movement of slide	8¼″
Transverse movement of slide	4″
Floor space	24″ x 29″
Speed of 6″ wheel	3200 Rev. per Min.
Speed of 8″ wheel	2400 Rev. per Min.
Weight with countershaft	861 lbs.
Weight with countershaft boxed for foreign shipment	1113 lbs.
Weight with countershaft crated	1010 lbs.
Cubic Dimensions boxed for foreign shipment	53 cu. ft.

If we guarantee to do something, we are going to do it at any cost. We do not want your business by false statements.



3/8 Inch Turret Full Automatic Machine—Model G

Do not make

MODEL G

3/8 Inch Turret Full Automatic Machine

FOR CODE WORDS SEE COMBINATIONS, PAGE 278

RANGE:

Chuck Capacity	3/8 in.
Length of Stock Feed	5¾ in.
Milling Length	3½ in.
Turret Face to Face of Chuck (Maximum)	5⅝ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	⅞ in.
Height from Top of Cross Slide to Center of Spindle	1 5/16 in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M. Minimum	980
Speeds, R. P. M. Maximum	5000

DRIVE:

Belt Widths Spindle	1 in.
Belt Widths Feed	1¼ in.
Motor Drive, H. P. Required	1½
Step Diameters of Cone on Countershaft and Width of Face	8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.	1010, 855, 735

STANDARD ATTACHMENTS:

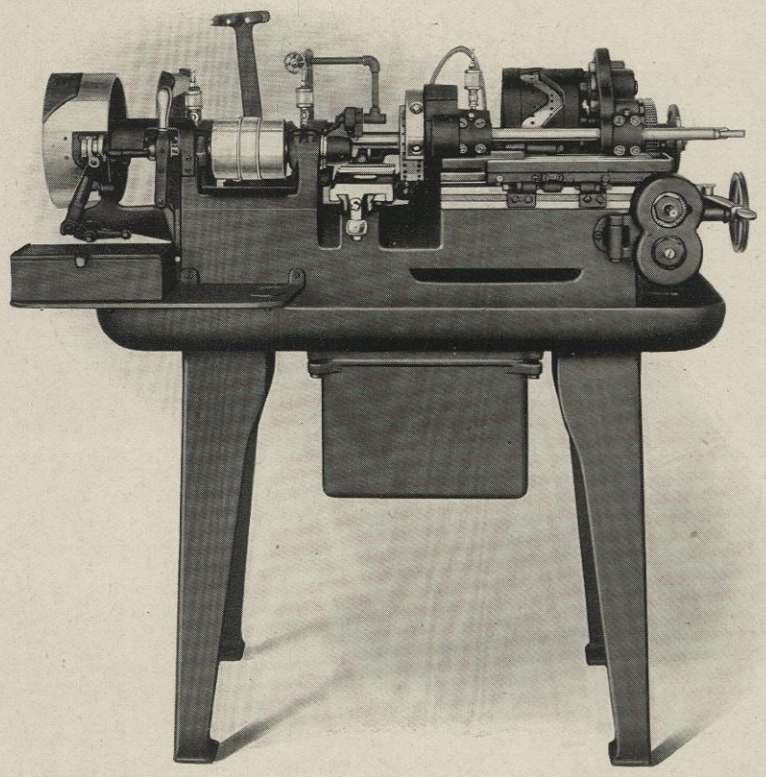
Magazine
Slotting and Slabbing
Shaving
Thread Rolling
Independent Cut-off
High Speed Drilling, Counterboring and Reaming
Oil Feed through Turret
Double Cross Slides

FLOOR SPACE ..... 34x54 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	145 lbs.
Foreign Shipment—Box Weight	335 lbs.
Cubic Feet Boxed for Foreign Shipment	64. 2
Net Weight of Machine with Countershaft	1262 lbs.

The CLEVELAND is designed to load your gun speedily and prepare you for the many chances in the business game.



3/8-1/2 Inch Turret Full Automatic Machine—Model G

MODEL G

3/8—1/2 Inch Turret Full Automatic Machine

FOR CODE WORDS SEE COMBINATIONS, PAGE 278

RANGE:

Chuck Capacity	½ in.
Length of Stock Feed	5¾ in.
Milling Length	3½ in.
Turret Face to Face of Chuck (Maximum)	5⅝ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	⅞ in.
Height from Top of Cross Slide to Center of Spindle	1 5/16 in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	980
	Maximum	5000

DRIVE:

Belt Widths	Spindle	1 in.
	Feed	1¼ in.
Motor Drive, H. P. Required		1½
Step Diameters of Cone on Countershaft and Width of Face		8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.		1010, 855, 735

STANDARD ATTACHMENTS:

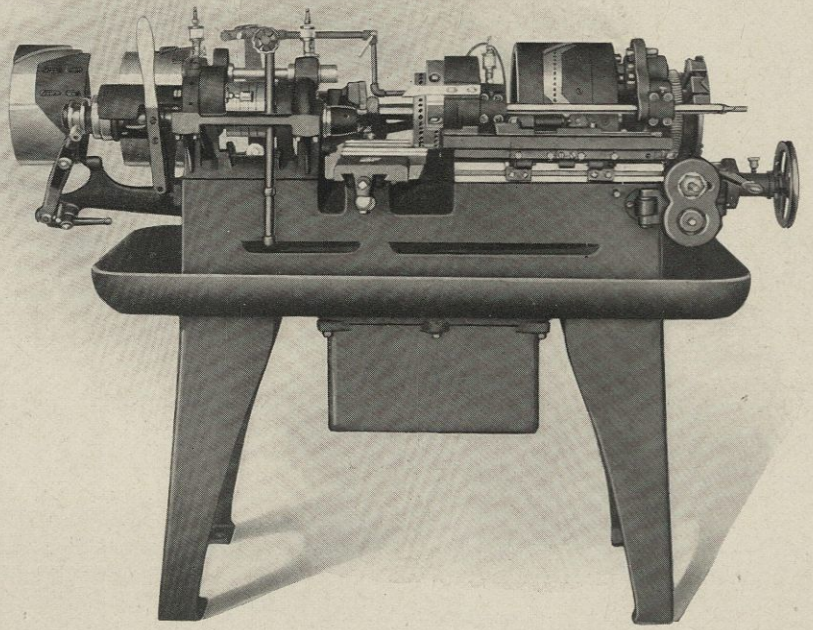
Magazine
Slotting and Slabbing
Shaving
Thread Rolling
Independent Cut-off
High Speed Drilling, Counterboring and Reaming
Oil Feed through Turret
Double Cross Slides

FLOOR SPACE 34x54 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	145 lbs.
Foreign Shipment—Box Weight	335 lbs.
Cubic Feet Boxed for Foreign Shipment	64.2
Net Weight of Machine with Countershaft	1262 lbs.

Every lot of machines that we manufacture is improved in some respect. It costs, but it pays.



5/8 Inch Turret Full Automatic Machine—Model G

MODEL G

5/8 Inch Turret Full Automatic Machine

FOR CODE WORDS SEE COMBINATIONS, PAGE 278

RANGE:

Chuck Capacity	5/8 in.
Length of Stock Feed	8½ in.
Milling Length	4½ in.
Turret Face to Face of Chuck (Maximum)	10¼ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1 1/16 in.
Height from Top of Cross Slide to Center of Spindle	2¼ in.

SPINDLE SPEEDS:

Number of Changes	6
Speeds, R. P. M. Minimum	282
Speeds, R. P. M. Maximum	1243

DRIVE:

Belt Widths Spindle	1½ in.
Belt Widths Feed	1¼ in.
Motor Drive, H. P. Required	2
Step Diameters of Cone on Countershaft and Width of Face	8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.	533, 450, 385

STANDARD ATTACHMENTS:

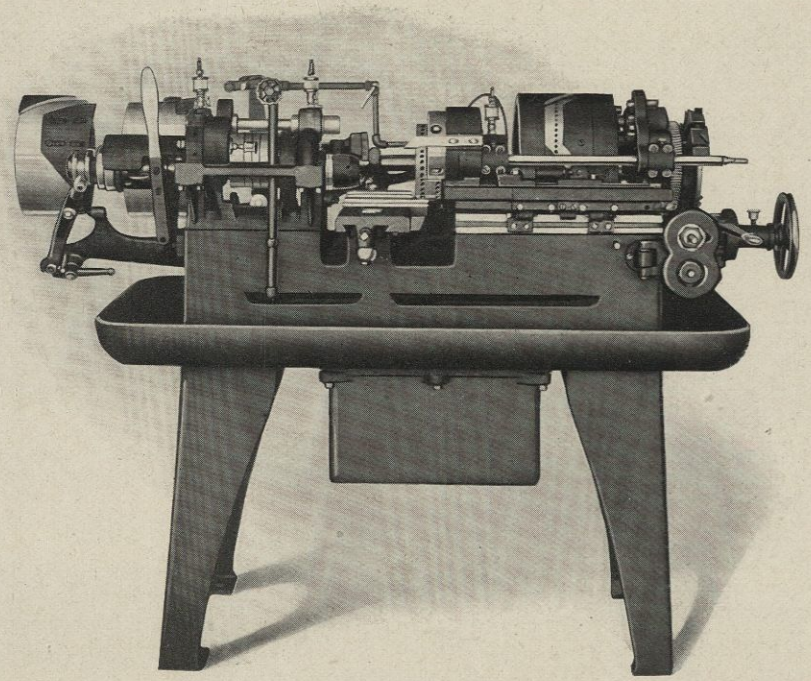
Magazine
Slotting and Slabbing
Shaving
Thread Rolling
Independent Cut-off
High Speed Drilling, Counterboring and Reaming
Oil Feed through Turret
Double Cross Slides

FLOOR SPACE ..... 38x69 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	270 lbs.
Foreign Shipment—Box Weight	433 lbs.
Cubic Feet Boxed for Foreign Shipment	84. 2
Net Weight of Machine with Countershaft	2031 lbs.

You will find CLEVELANDS everywhere. The reason—they are dependable, always producing.



5/8-7/8 Inch Turret Full Automatic Machine—Model G

MODEL G

5/8—7/8 Inch Turret Full Automatic Machine

FOR CODE WORDS SEE COMBINATIONS, PAGE 278

RANGE:

Chuck Capacity	7/8 in.
Length of Stock Feed	8½ in.
Milling Length	4½ in.
Turret Face to Face of Chuck (Maximum)	10¼ in.

TURRET AND CROSS SLIDE:

Number of Turret Holes	5
Diameter of Turret Holes	1 1/16 in.
Height from Top of Cross Slide to Center of Spindle	2¼ in.

SPINDLE SPEEDS:

Number of Changes		6
Speeds, R. P. M.	Minimum	282
	Maximum	1243

DRIVE:

Belt Widths	Spindle	1½ in.
	Feed	1¼ in.
Motor Drive, H. P. Required		2
Step Diameters of Cone on Countershaft and Width of Face		8, 9 and 10x2⅛ in.
Speeds of Countershaft, R. P. M.		533, 450, 385

STANDARD ATTACHMENTS:

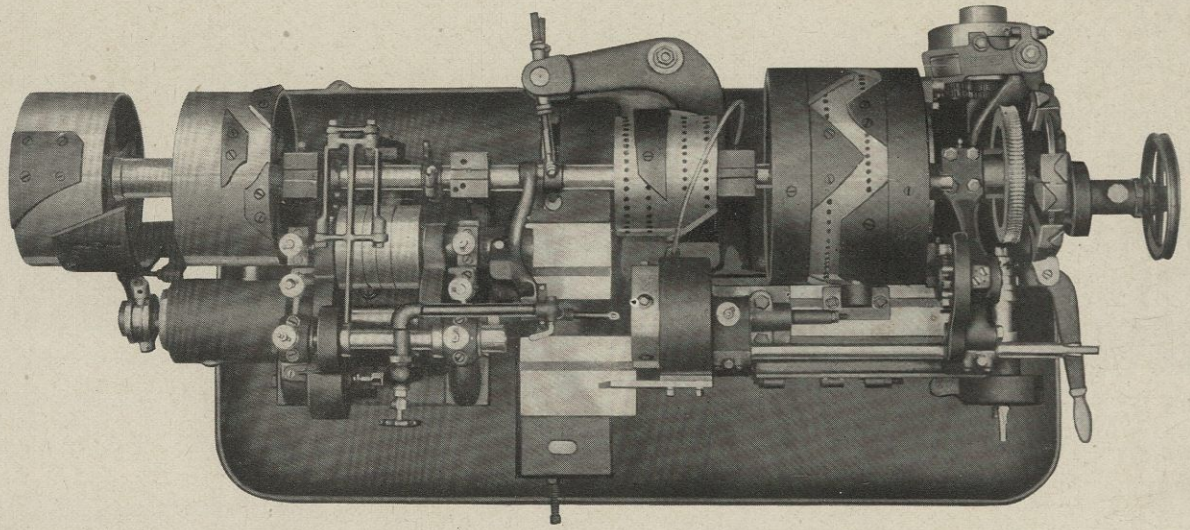
Magazine
Slotting and Slabbing
Shaving
Thread Rolling
Independent Cut-off
High Speed Drilling, Counterboring and Reaming
Oil Feed through Turret
Double Cross Slides

FLOOR SPACE ..... 38x69 in.

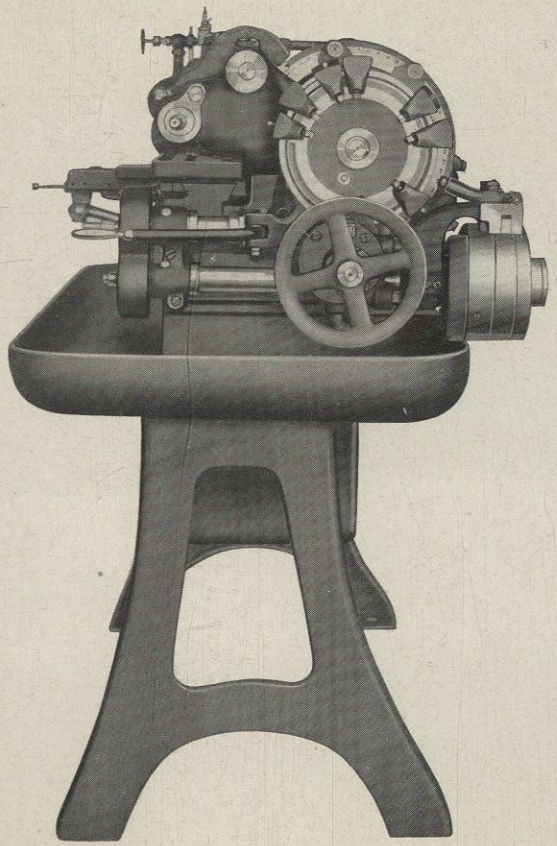
SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	270 lbs.
Foreign Shipment—Box Weight	433 lbs.
Cubic Feet Boxed for Foreign Shipment	84. 2
Net Weight of Machine with Countershaft	2076 lbs.

Fifteen-year-old CLEVELANDS right on the job are one of our best selling agents.

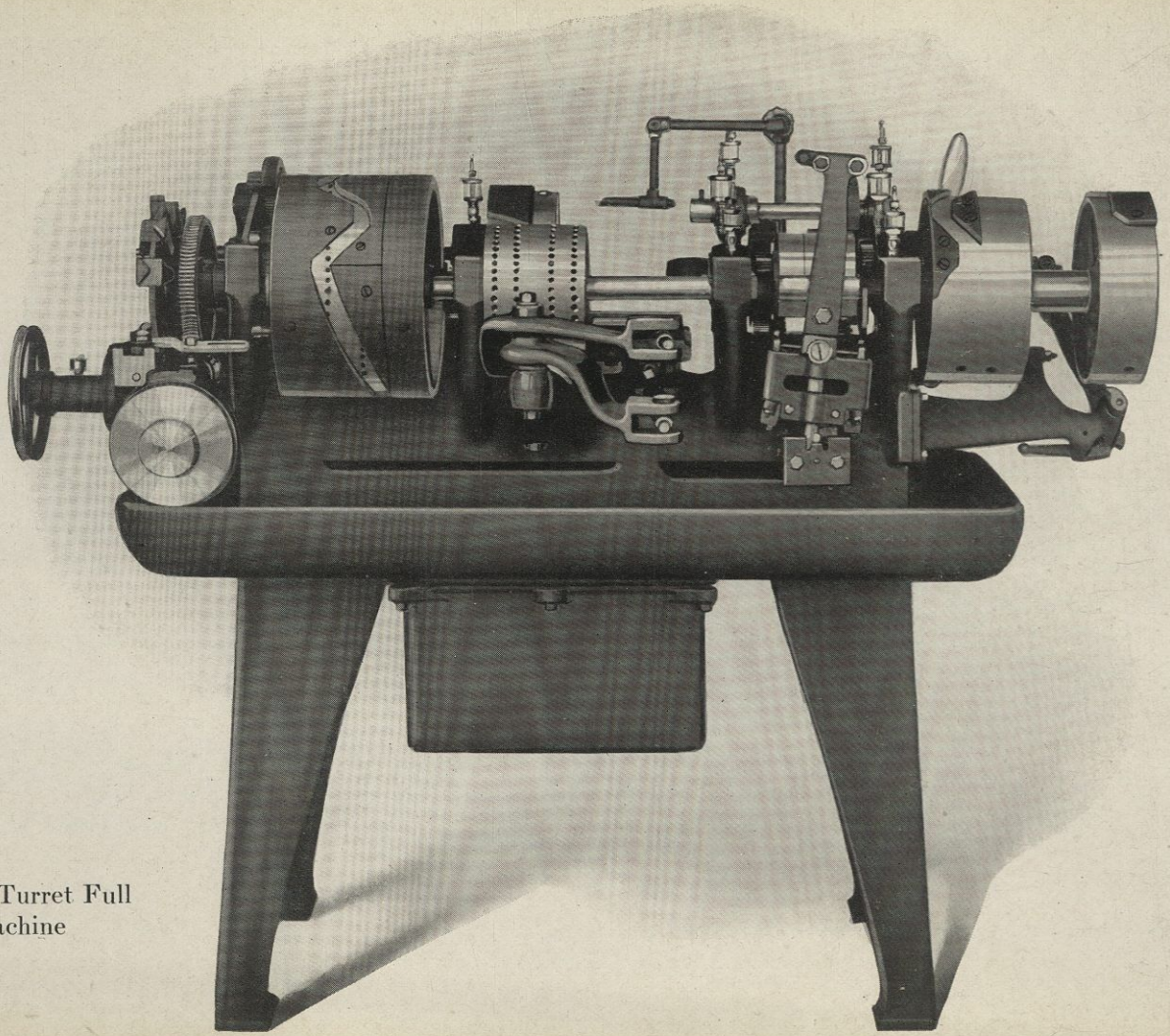


Top View of Turret Full Automatic Machine—Model G



Model G—End View

The lever shown at the left is intended for disconnecting the feed instantaneously, also for starting of same. The cams shown on the drum and circular disc are intended for indexing the turret any time desired and for the moving of the belt from the tight to loose pulley of the feed. Either set of dogs can be moved to any position on the machine and the turret indexed and belt shifted when desired, depending upon the class of work you are producing.



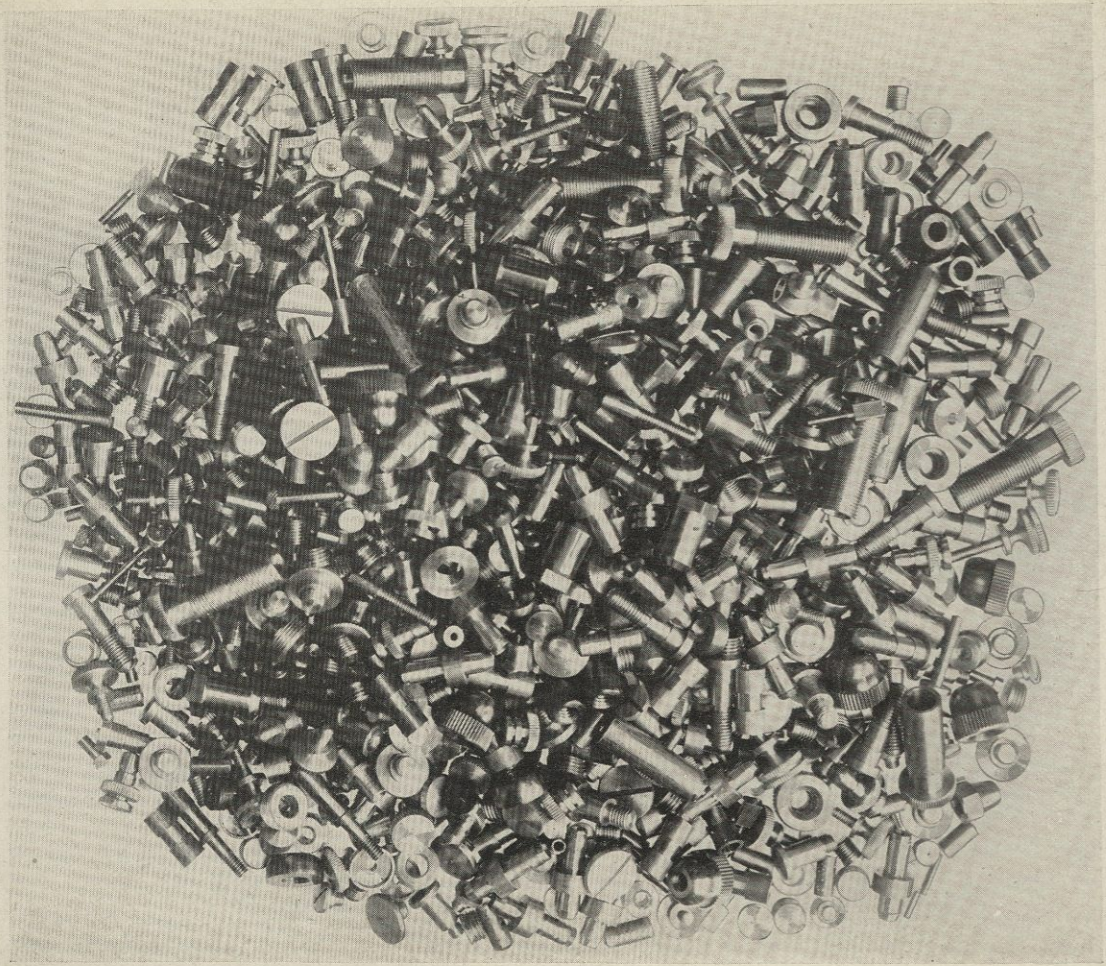
Rear View of Turret Full Automatic Machine —Model G

Rear View of Model G

Here we show a rear view of our Model G machine, and the one thing to which we wish to call your attention is the simplicity of design and the accessibility to all working parts. The spindle head, belt shifter and the adjustment of the cross slide and tool feed are all within easy reach from the rear of the machine. A CLEVELAND is different in this respect from nearly all the other automatics. All the mechanism on a CLEVELAND Automatic is visible, which means it is accessible without taking the machine apart in any way to make adjustments.

The rod that controls the stock feed and the stock feed segment is in a convenient location.

The points we are bringing out are important from an operator's standpoint, as there is no waste of time in making any of the adjustments above mentioned.

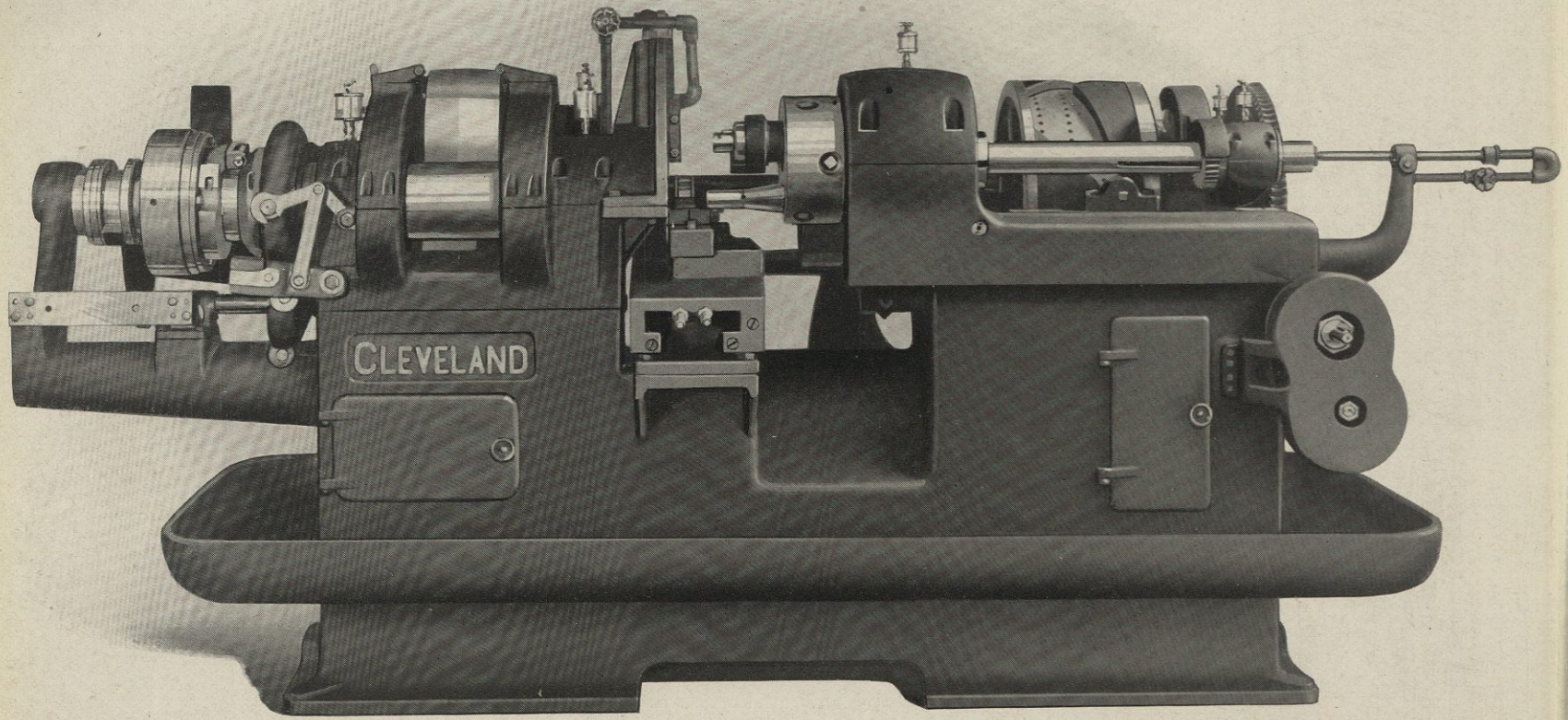


Work Produced on Model G—Full Turret Automatic Machine

Work Produced on Model G Machines

Notice the nest of small parts that are being produced on our Model G machines in various factories in this country. Pieces for sewing machines, typewriters, talking machines, adding machines, etc., etc., all in this lot of samples. The idea is to have you realize that on our Model G and our other small automatics we can produce the most accurate work necessary for all purposes and almost any shape desired.

On this machine we can form, neck, thread, recess, slot, shave and complete the piece in most instances on both ends, doing away with a second operation.



4 Inch Heavy Type Three Hole Turret Full Automatic Machine—Model H

Used by Fafnir Bearings

MODEL H

4 Inch Heavy Type Three Hole Turret Full Automatic Machine

CODE—HABIT

RANGE:

Chuck Capacity	4	in.
We furnish this model in capacities of 4¼ in. and 5½ in.		
Length of Stock Feed	6	in.
Milling Length	6	in.
Longitudinal Adjustment of Turret Head on Bed	5⅜	in.
Turret Face to Face of Chuck — Minimum	7⅝	in.
Turret Face to Face of Chuck — Maximum	13	in.

TURRET AND CROSS SLIDE:

Diameter of Turret Holes	2¾	in.
Height from Center of Spindle to Top of Cross Slide	4	in.

SPINDLE SPEEDS:

Number of Changes	6	
Speeds, R. P. M. — Minimum	43	
Speeds, R. P. M. — Maximum	242	

DRIVE:

Belt Width	4	in.
Motor Drive, H. P. Required	8	
Step Diameters of Cones on Countershaft and Width of Face	12½, 14 and 15½x5¼	in.
Speeds of Countershaft, R. P. M.	436, 360, 300	

STANDARD ATTACHMENTS:

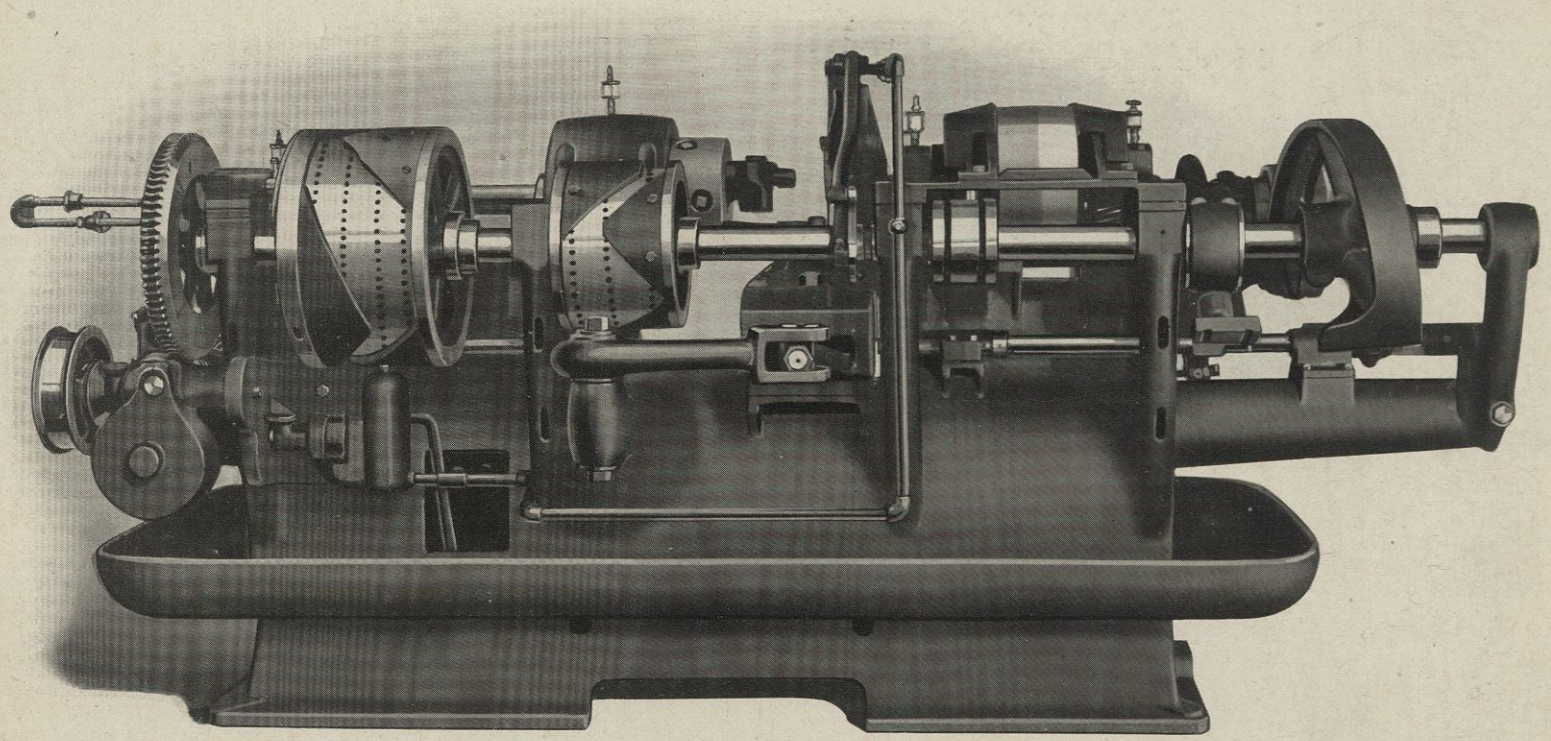
	Code
Independent Cut-off	*Mobilect*
High Speed Drilling, Reaming and Counterboring	*Ash*
Double Cross Slides	*Redgum*
Oil Feed through Turret	*Oil*
Turret Turning	*Reverect*

FLOOR SPACE 71x142 in.

SHIPPING DIMENSIONS:

Domestic Shipment—Crate Weight	1000	lbs.
Foreign Shipment—Box Weight	1450	lbs.
Cubic Feet Boxed for Foreign Shipment	375	
Net Weight of Machine with Countershaft	11840	lbs.

The CLEVELAND is blessed with an abundance of backbone. Without it you could not expect much.



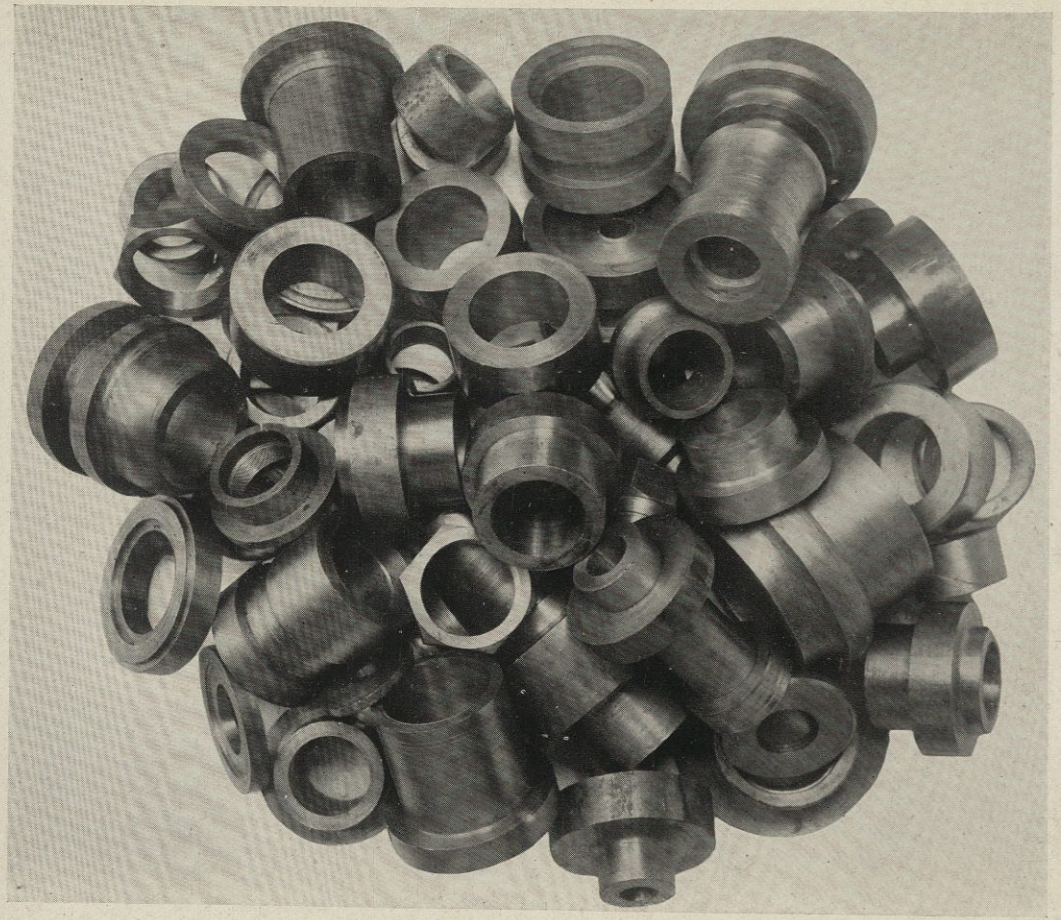
Rear View of Heavy Type Three Hole Turret Machine—Model H

Rear View of Model H

Here we show a rear view of our Model H machine, and the one thing to which we wish to call your attention is the simplicity of design and the accessibility to all working parts. The spindle head, belt shifter and the adjustment of the cross slide and tool feed are all within easy reach from the rear of the machine. A CLEVELAND is different in this respect from nearly all the other automatics. All the mechanism on a CLEVELAND Automatic is visible, which means it is accessible without taking the machine apart in any way to make adjustments.

The rod that controls the stock feed and the stock feed segment are in a convenient location.

The points we are bringing out are important from an operator's standpoint, as there is no waste of time in making any of the adjustments above mentioned.

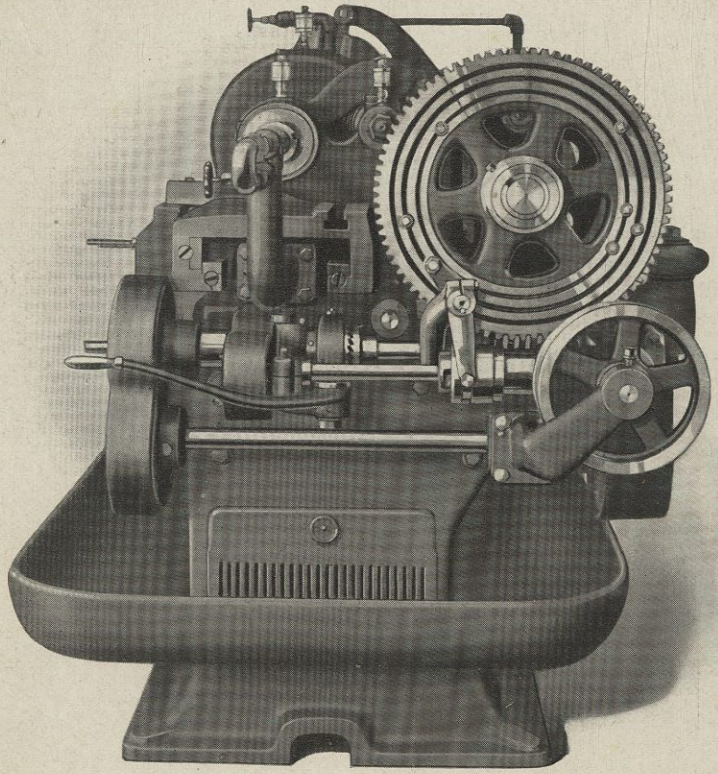


Work Produced on
Heavy Type
Three Hole Turret
Machine—
Model H

Work Produced on Model H Machines

We show here a good sized group of different shaped pieces that can be produced exceptionally accurate and rapid on our latest Model H machine. This machine is made extremely heavy, has three holes in the turret, and can be supplied with motor drive.

The machine is intended for the rapid production of various shaped pieces, particularly so for bearing work.



Tool Feed End View of Model H Machine

Model H—End View

This is an end view of our Model H machine.

The lever at the left is used for disconnecting the feed or starting the machine, similar to our Models B and C. On the face of the large wheel on end of cam shaft is tripping pins that can be moved spherically to trip the tool feed from high to low speed and vice versa, by engaging and disengaging the clutch shown on shaft below.

We would call your attention to the neatness of design and compactness of mechanism.

CONTENTS

Model A Features and Attachments

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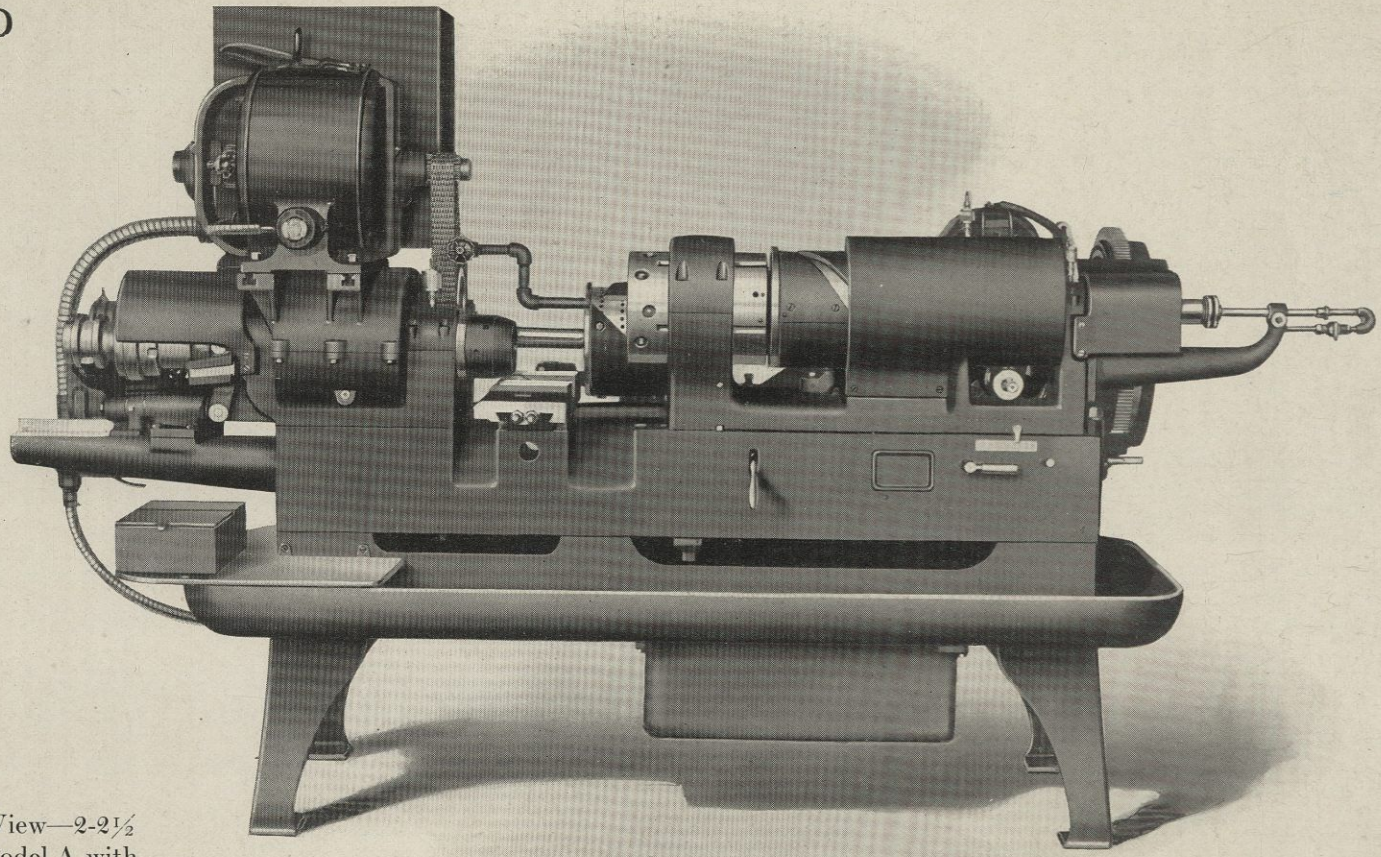


Front View—2-2½ Inch Model A with Motor Drive

Cleveland Full Automatic Motor Driven Machine

This Motor Driven Machine is ideal for all around screw machine work.

It is easy to change over from one job to another. No special cams are necessary, as all feeds and speeds desired for each cutting tool are obtained by the one set of adjustable cams supplied with the machine.

The machine is equipped with two motors. The one driving the spindle is a variable speed, quick reversing motor, controlled by a simple mechanical apparatus, operated by adjustable cams which allow the selection of any one of 16 different spindle speeds in either direction.

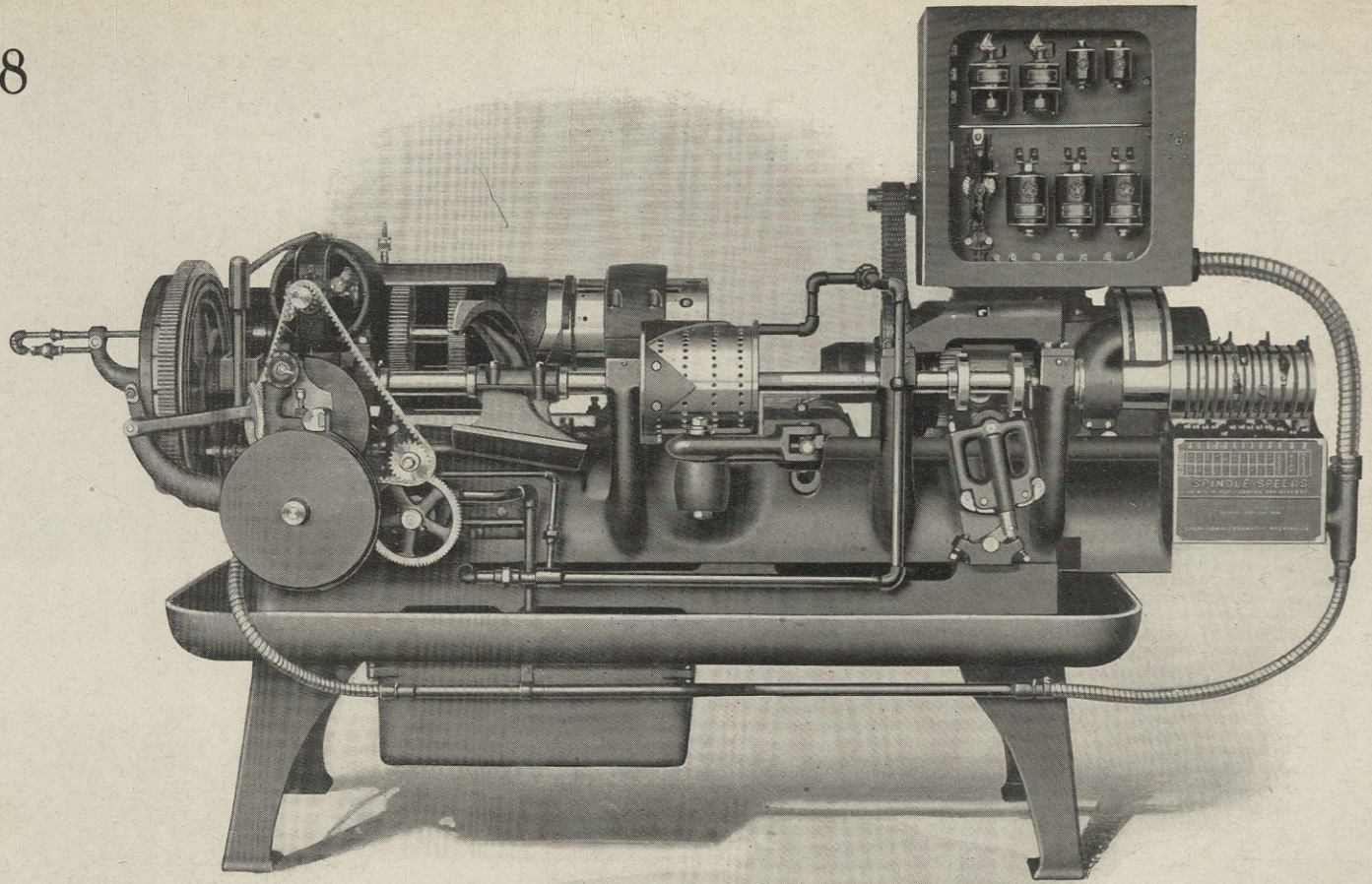
The tool feed is driven by a constant speed motor which gives constant idle movement; variable feed for tools being obtained by a mechanical feed regulating device.

Push Button Control

One push button operates both motors which are interlocked electrically, an overload on either motor will stop the entire machine.

Both motors are supplied with automatic accelerators, and overload relays; both relays operate from the main automatic switch, in this manner fully protecting both of the motors without the necessity of a fuse in the entire equipment.

(Continued Page 129)



Rear View Motor
Driven—Model A

Cleveland Full Automatic Motor Driven Machine—Continued

General Arrangement of Electrical Apparatus

All wiring is enclosed in conduits.

Both motors are arranged with adjustment for tightening the silent chains which transmit the power.

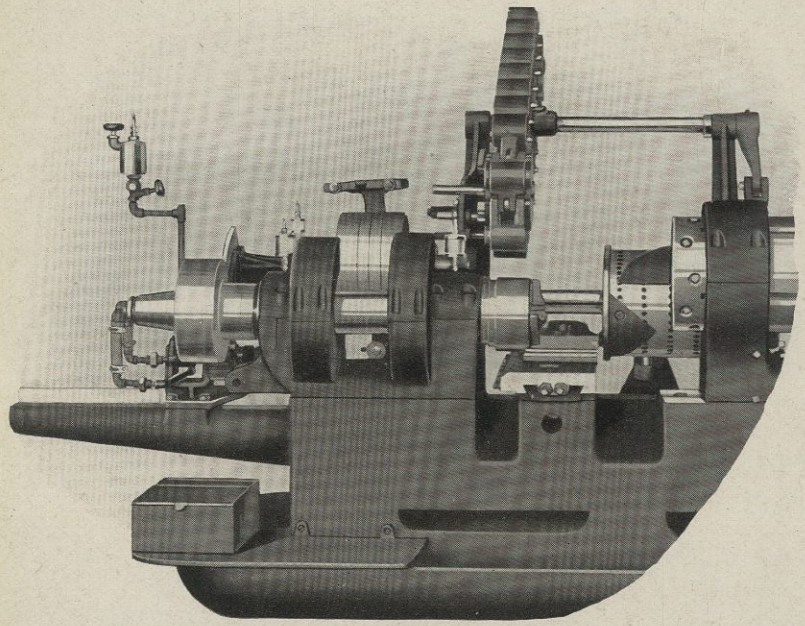
It is not necessary for an operator to know anything about the electrical apparatus, as it is entirely self-contained and proof against abuse and rough handling.

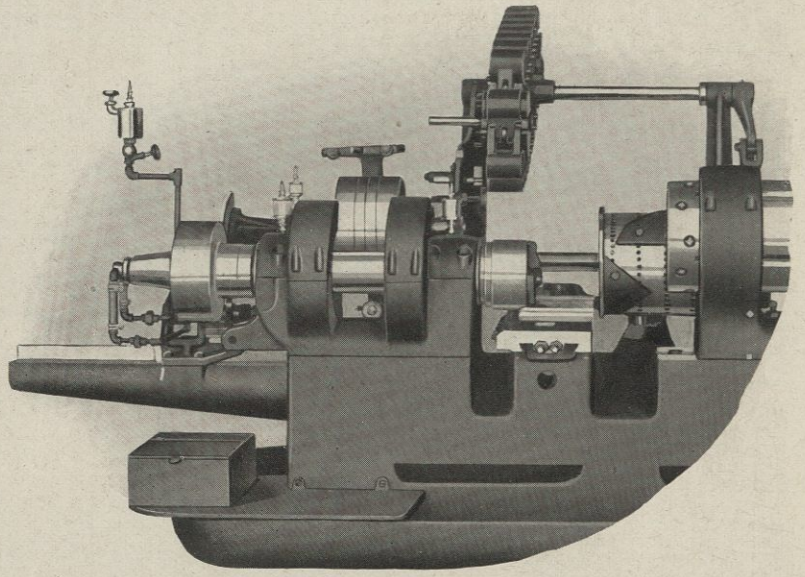
Current Necessary

This machine may be equipped with motors for either 110 or 220 volt Direct Current.

Shipping Dimensions

Net Weight of Machine	5500 lbs.
Weight of Crate, for Domestic Shipment	500 lbs.
Weight of Box, for Foreign Shipment	815 lbs.
Cubic Dimensions, Boxed for Foreign Shipment	203 cu. ft.



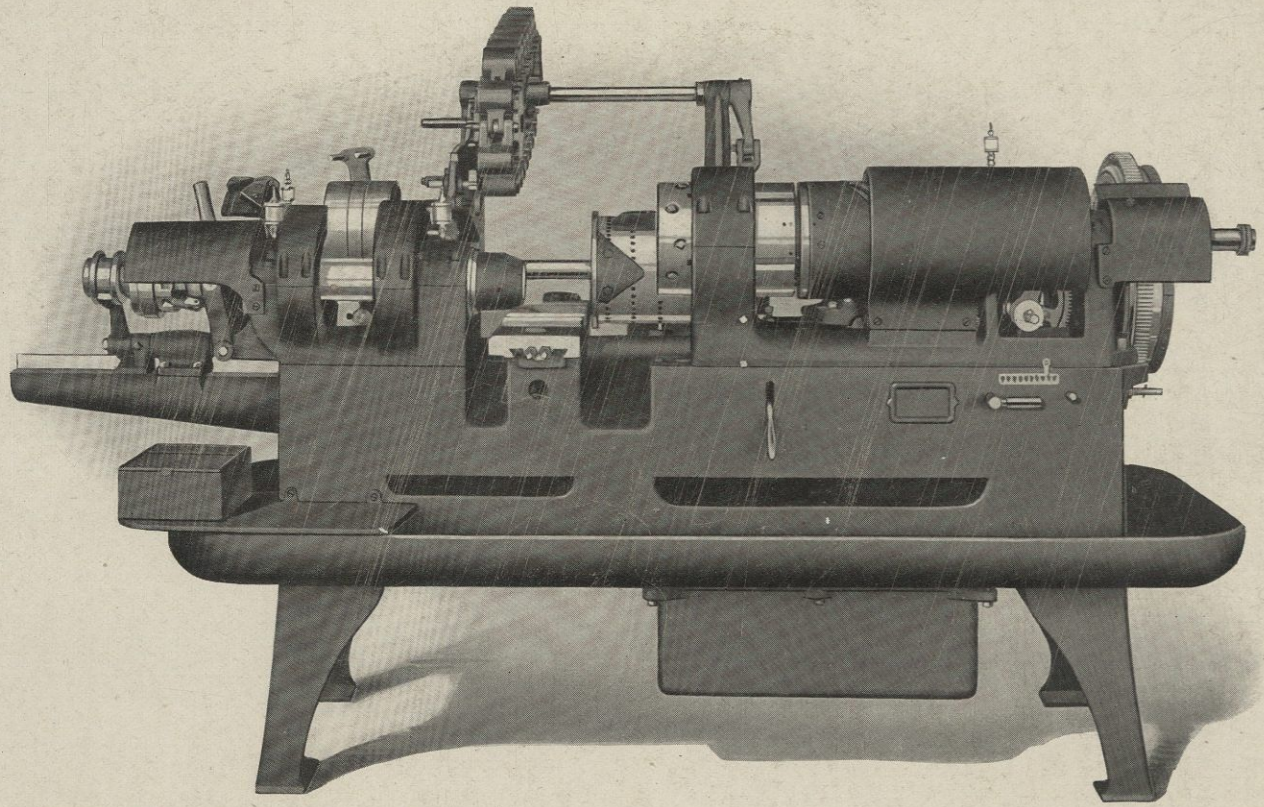


Rotary Tilting Magazine with Air Chuck Combination

Combination Air Chuck and Magazine on 2 Inch Model A Machine

The view on left hand side of opposite page is our Model A 2-in. Automatic with an air equipment attached and our rotary tilting magazine in its lower position, or, in other words, in line with the turret hole.

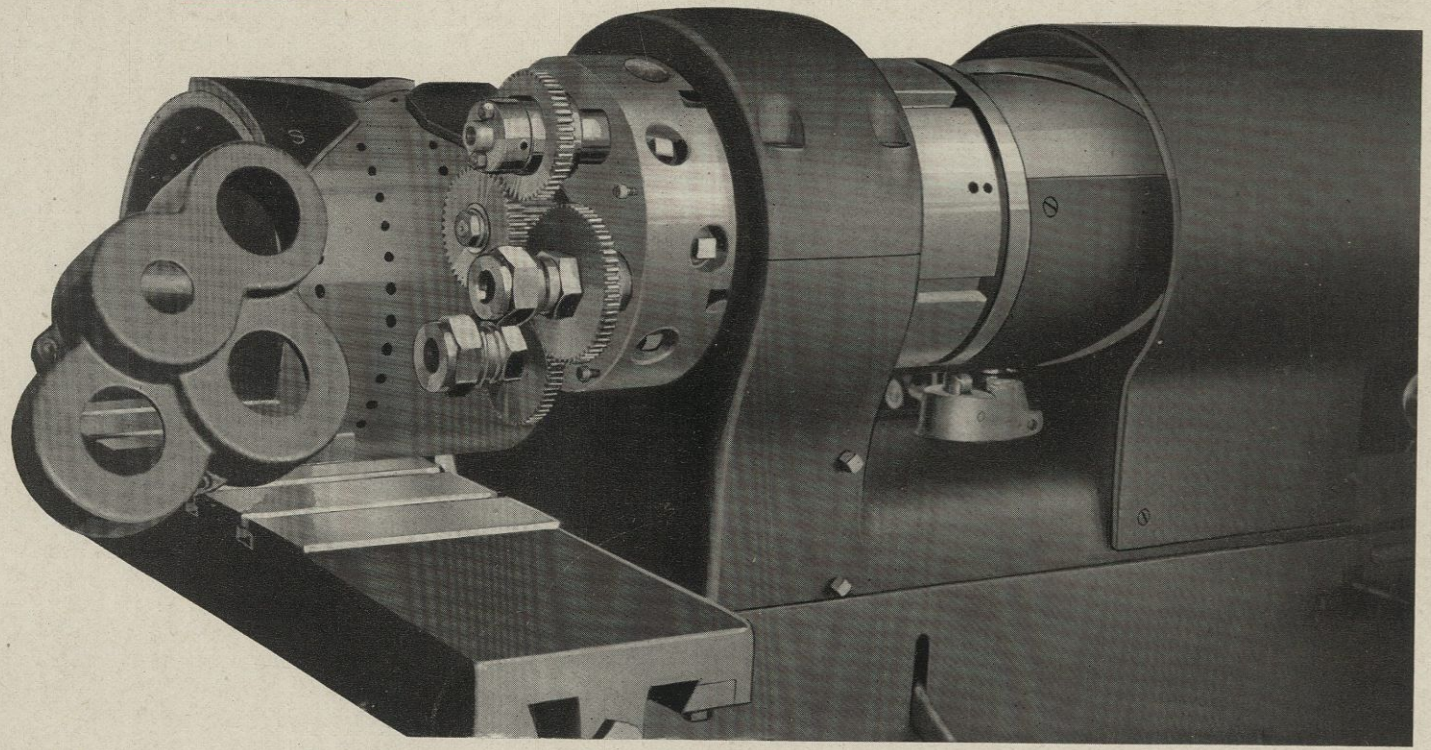
The view on right hand side shows the rotary tilting magazine tilted back clearing all the tools in the turret.



K-97—Rotary Tilting Magazine on 2 Inch Model A Machine

K-97 Rotary Tilting Magazine on 2 Inch Model A Machine

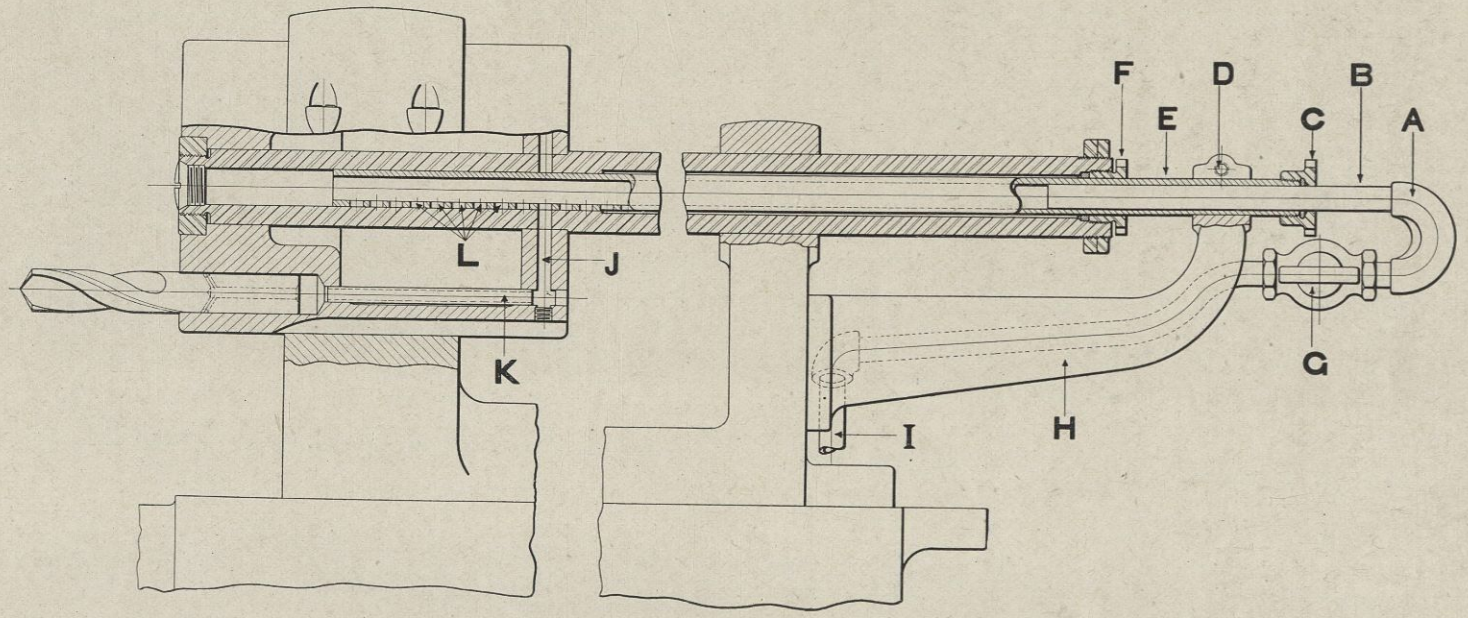
On the opposite page is a Model A 2-In. Automatic machine showing a rotary tilting magazine in the upper position. This magazine is exceptionally simple to operate and a vast number of castings of various shapes can be magazined and all the operations performed, that is the first and second operations. Many pieces dropped from the bar, by a second operation can be completed by the use of this magazine.



K-49—Single
K-50—Double
High Speed Drilling Attachment for Model A Machine

K-49—High Speed Drilling Attachment for Models A and G

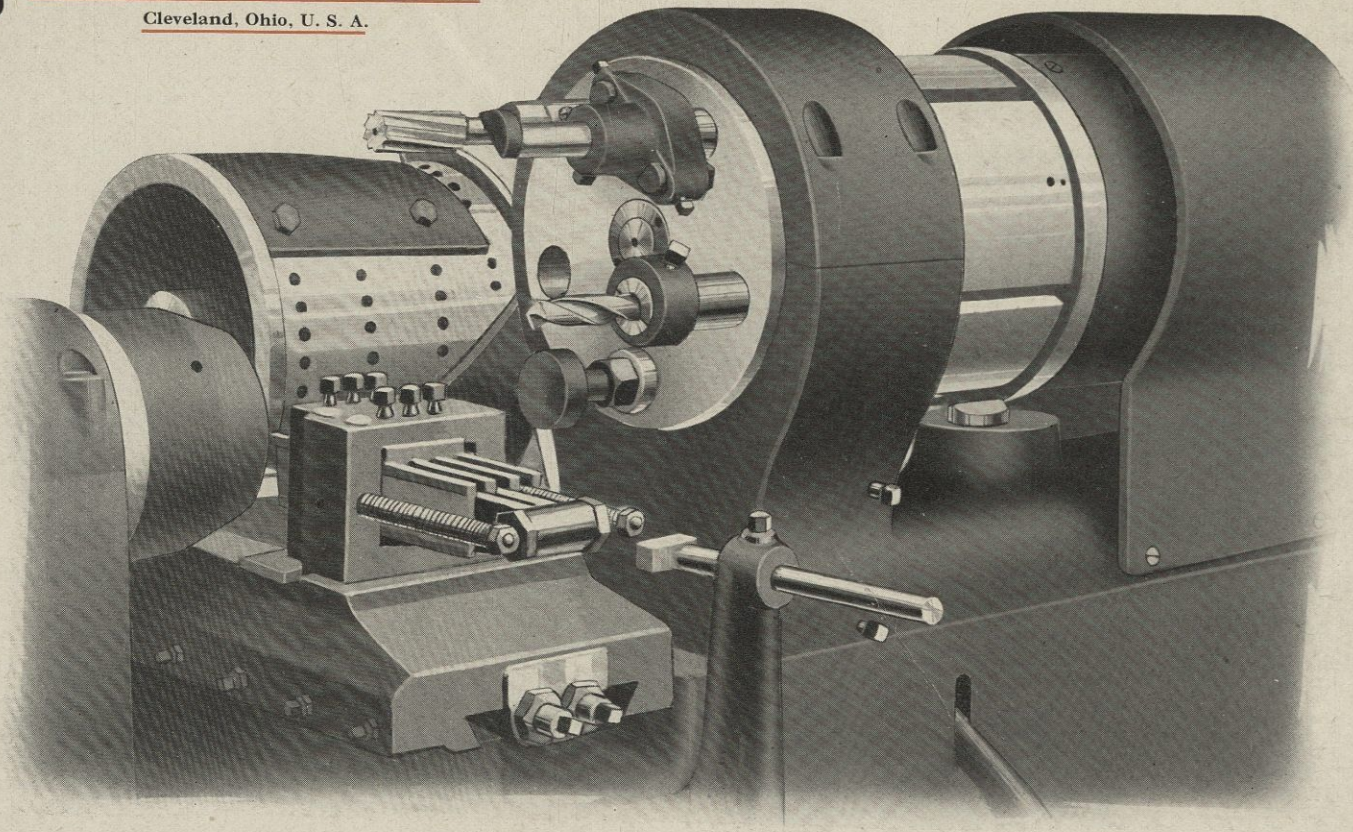
In many instances one or more small holes are to be drilled in a piece being made on the automatic. In this case the spindle speed required for the regular turret and cross slide tools would be too slow for the small drills, and the high speed drilling attachment is designed to rotate the small drills, counterbores, reamers, etc., at their proper speeds. The drill is gripped in a holder, which is driven by spur gears. The driving shaft extends through the center of the turret shaft and carries a gear on its front end and a pulley at its rear end, this pulley being driven by a belt from the countershaft. As the driving gear is at the center of turret, the drill holders may be placed in any of the holes in turret and two or more may be used if required. The drill does not rotate as rapidly in this way as it would if used in a drill press on stationary work, as the cutting speed is the sum of the spindle and drill holder speeds added together.



K-53—Oil Feed Attachment for Machines—Models A and C

K-53—Oil Feed Attachment

This attachment is adaptable to all Turret Model A and 3-Hole Turret Full Automatic Model C Machines. It supplies oil to each turret hole and, for this reason, the oil tube drills, reamers, boring tools, counterbores, etc., may be placed in any, or all, turret holes, as required. The valve mechanism that controls the flow of oil to the different turret holes permits its flow only to the tool that is actually cutting and shuts off the oil from all other turret holes. The starting and stopping of the flow of oil is accomplished by the moving forward and backward of the turret shaft. The oil tube "E" which extends inside the turret shaft is the valve that controls the flow of oil. This tube is adjustable longitudinally and is clamped in any position by clamp screw "D" in oil feed bracket "H." At the forward end of this main oil tube "E" will be seen the single row of holes "L" at the lower part of the tube and extending for a length equal to the stroke of the turret. This oil tube being held stationary at all times, when the turret shaft moves forward and back on the regular turret stroke, the hole "J" in the turret passes over the series of holes in the tube and, consequently, there is a flow of oil through the hole "J" and the tube "K" to the turret hole and from there through the oil tubes of the tool. The oil is forced only to the lowest turret hole, which is in line with the spindle of the machine; therefore, all other holes in the turret are shut off. The position at which the oil tube is clamped determines when the flow of oil will commence. In other words, it is possible to have the flow of oil through the tool for the full length or for any part of the stroke, the idea is that if the work being done is short, the oil does not start to flow until the tool has reached the work; it is for this reason that the adjustment of the oil tube "E" is provided. The oil is received from the pump, under pressure, through the oil pipe "I," which is supported by oil feed bracket "H." The oil passes through the shut-off valve "G," this valve being provided so that the oil may be shut off, if it is not required, or the amount of oil can be regulated. It then passes through the return bend "A" into the short pipe "B" from which it is discharged into the main oil tube "E." The stuffing boxes "F" and "C" make oil tight joints to prevent leakage.



K-102—Multiple Cut-off Attachment

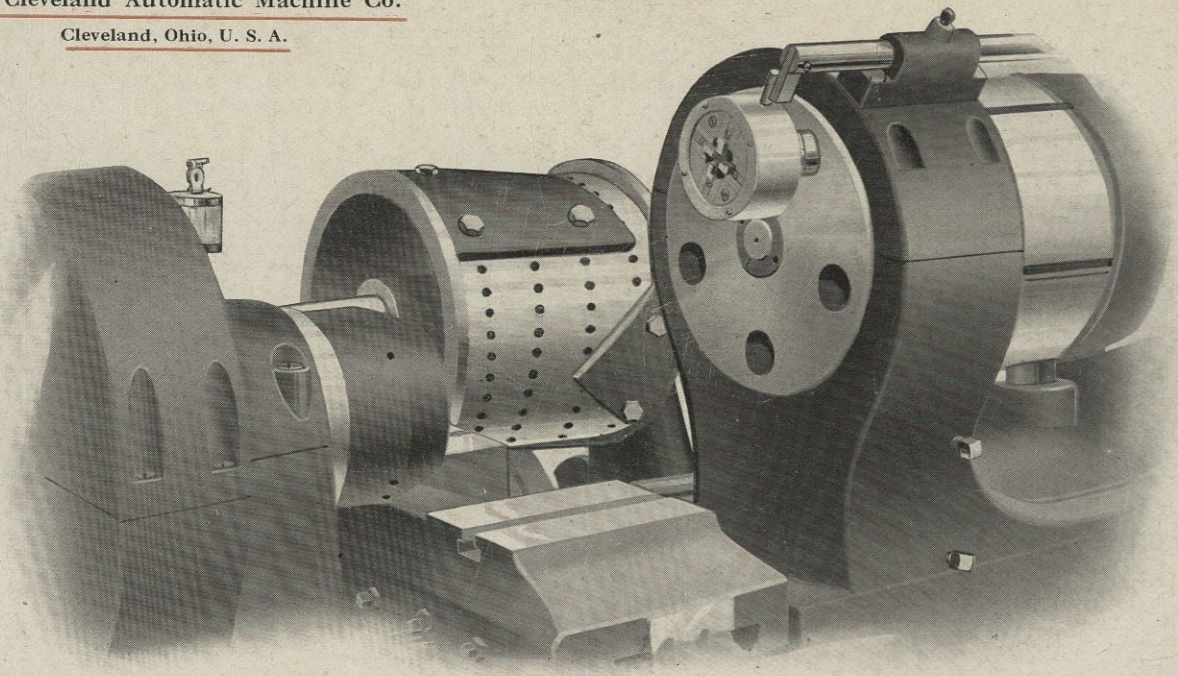
K-102—Multiple Cut-off Tool Post with Straight Blades for Machines—Models A, B and C

The cut shows this tool applied on the Full Turret Automatic. This particular tool has four blades which would cut off four pieces at once. Any number of tools may be applied in this manner, and the number of parts that may be cut off is limited to the depth of hole that can be drilled or the length of work that can be handled without springing away from the cutters.

The post can be supplied with different width filling in blocks between the blades for various widths of work. The thickness of work to be cut off should be given when ordering.

The ejecting bracket is attached to front of bed below cross slide and is fitted with adjustable plunger which strikes the stripper plate and ejects the work from between the blades when cross slide backs away.

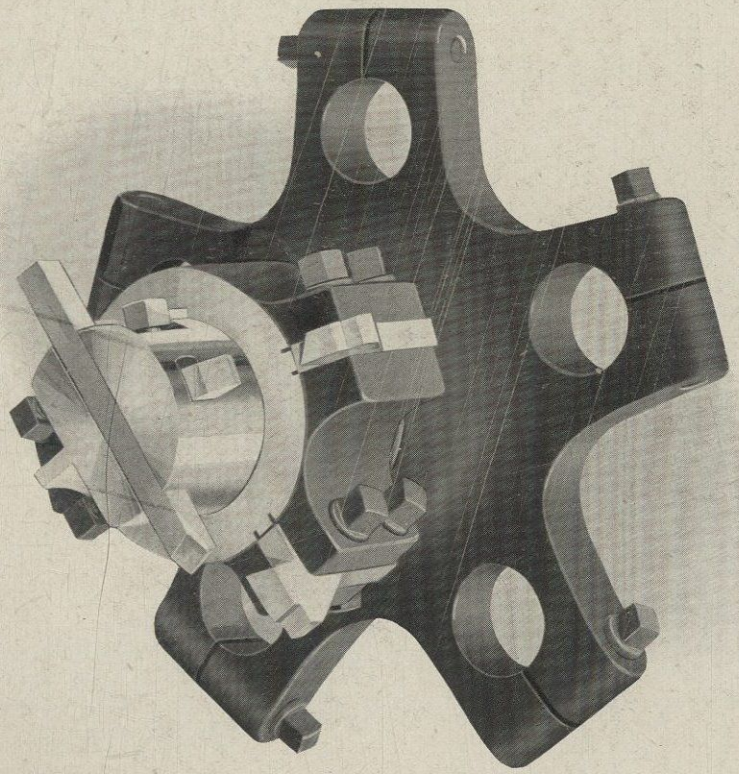
The two springs bring the ejecting slides back into their normal position when the cross slide carries the tool forward toward the work. A saving of from 20 to 50 per cent in time is accomplished by using this tool.



K-38—Die Closing Attachment for Machines—Models A and C

The base is fastened on the front side of turret cap directly over the spline in turret. The pin in die head comes in contact with the swinging dog and revolves the chaser cam ring a little beyond the locking position of the die head just as the turret has revolved to its locking position.

This insures the positive locking of the die head when turret advances. When the turret comes back in this position the pin strikes the edge of the dog which swings back and allows the turret to turn to the next locking position.

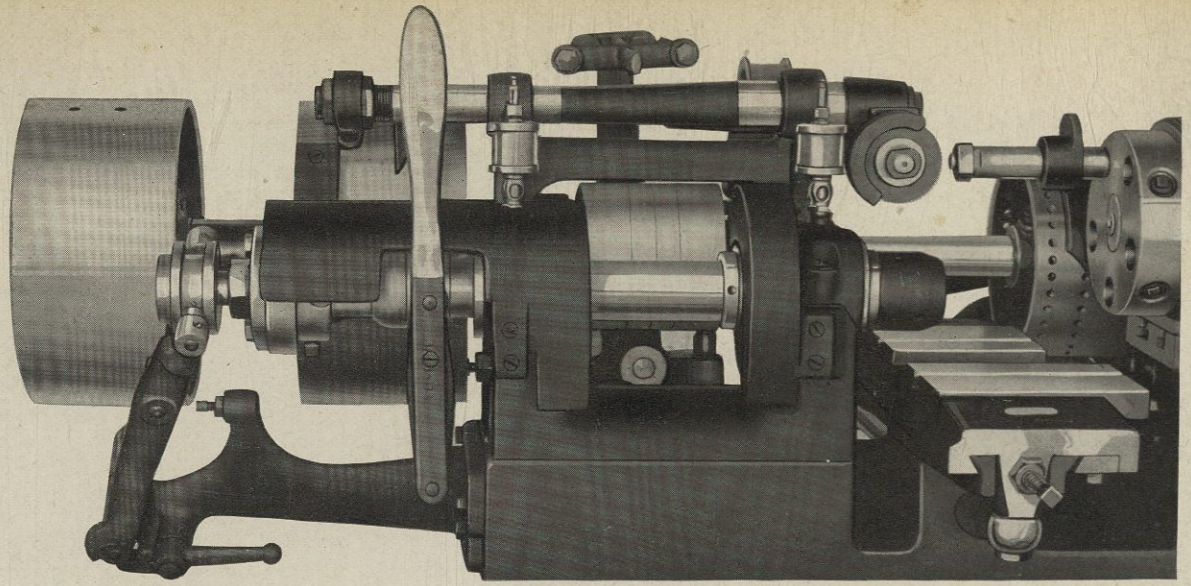


K-42—Overhanging Turning Attachment with Extra Cutting Head

This tool is attached to face of turret by clamping around the shank of each turret tool, and carries extra tools for rough and finish turning in addition to a full equipment of tools carried in the regular tool holes of turret.

The roughing and finishing tool are mounted in the stem. Also an extra cutter head can be supplied with cutters for rough and finish counterboring. The cutter head can be adjusted longitudinally.

Each set of cutters works simultaneously with the turret tool.



K-88—Slotting and Slabbing Attachment for Models A and C

This attachment is used for slotting the heads of screws or any similar work. The operation is done while the box tool is milling the body of the next piece so that there is no extra time consumed by the slotting operation. When the screw is milled and threaded and ready to be cut off, the turret advances carrying the screw slotting conveyor which takes hold of the screw, or part, at the time the cutting-off tool has parted same from the bar. The stock is then fed forward and the box mill commences milling the body of the next screw and at this time the conveyor, carrying the screw just cut off, brings the head into contact with the slotting saw. By the time the box mill has finished its cut, the saw is also through. The finished screw is ejected from the conveyor by the pin during one of the backward strokes of the turret. The slotting arm carrying the saw stands a slight distance back from the front face of the chuck hood to clear all turret tools, except when the conveyor, carrying a screw, comes in line with the saw, at which time the saw advances.

When slabbing is to be done, two slabbing cutters are mounted on the saw spindle, and the same movements take place as in slotting. It is also possible, by means of a special slotting arm, to cut a groove, or a slot, of any shape or depth lengthwise of a piece by raising the center of saw spindle so that the work will pass underneath the saw or milling cutter. The saw spindle is driven by the pulley which is in turn driven by a belt from the countershaft. If the part is produced with a forming tool on cross slide, there is no time lost when slotting or slabbing because both operations are simultaneous.

CONTENTS

Model B Features and Attachments

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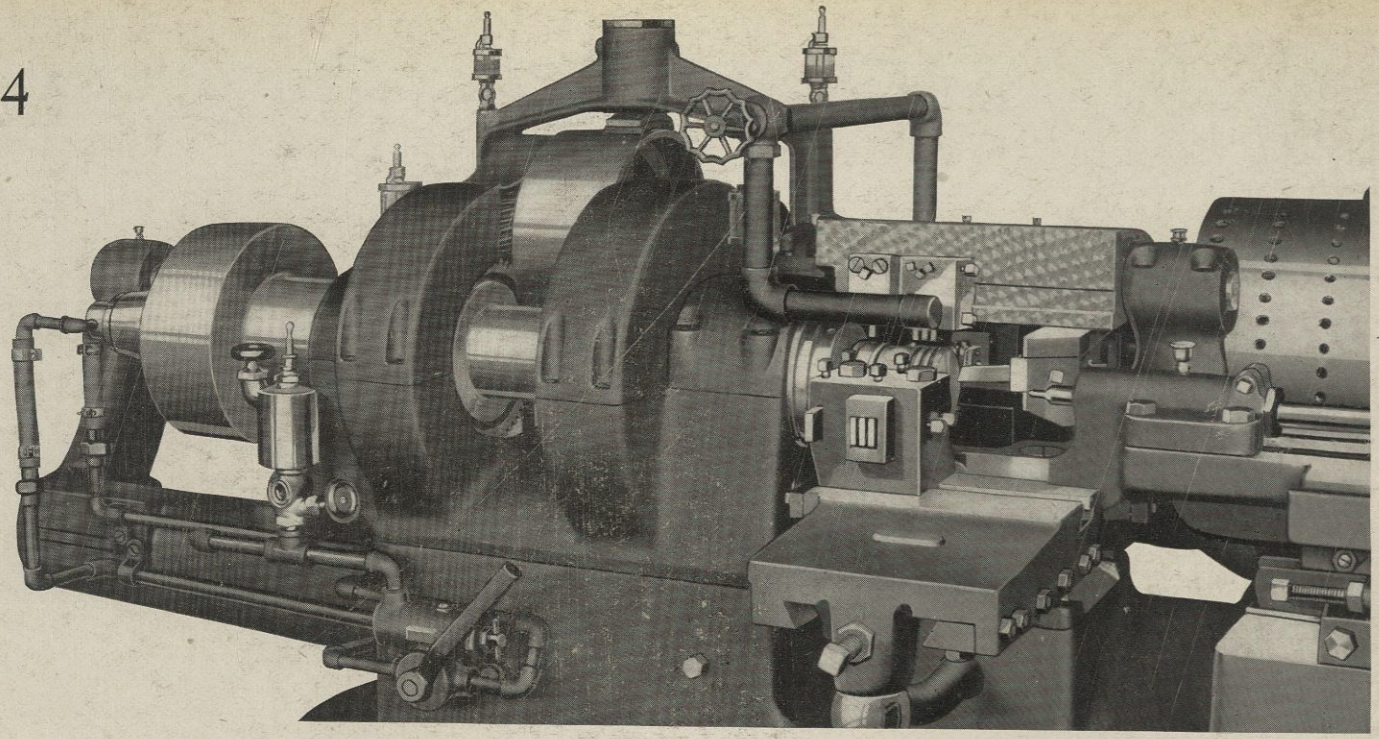
Cross Slide Taper Turning Attachment	152	153
Oil Feed Attachment for Model B	154	155
High Speed Drilling Attachment for Model B	156	157
Die Closing Attachment for Model B	158	.....



Piston Turning Automatic.

Piston Turning Automatic

The illustration on the opposite page shows a partial view of our 2-inch Model B machine, arranged for piston turning and the row of pistons offer some idea of the wide range and product of the machine.

We can turn pistons from 1 to 4 inches in diameter and 5 inches in length with as many grooves as desired.

Pistons are made in one or two operations although two operations are usually required to machine a piston to exact dimensions and are as follows:

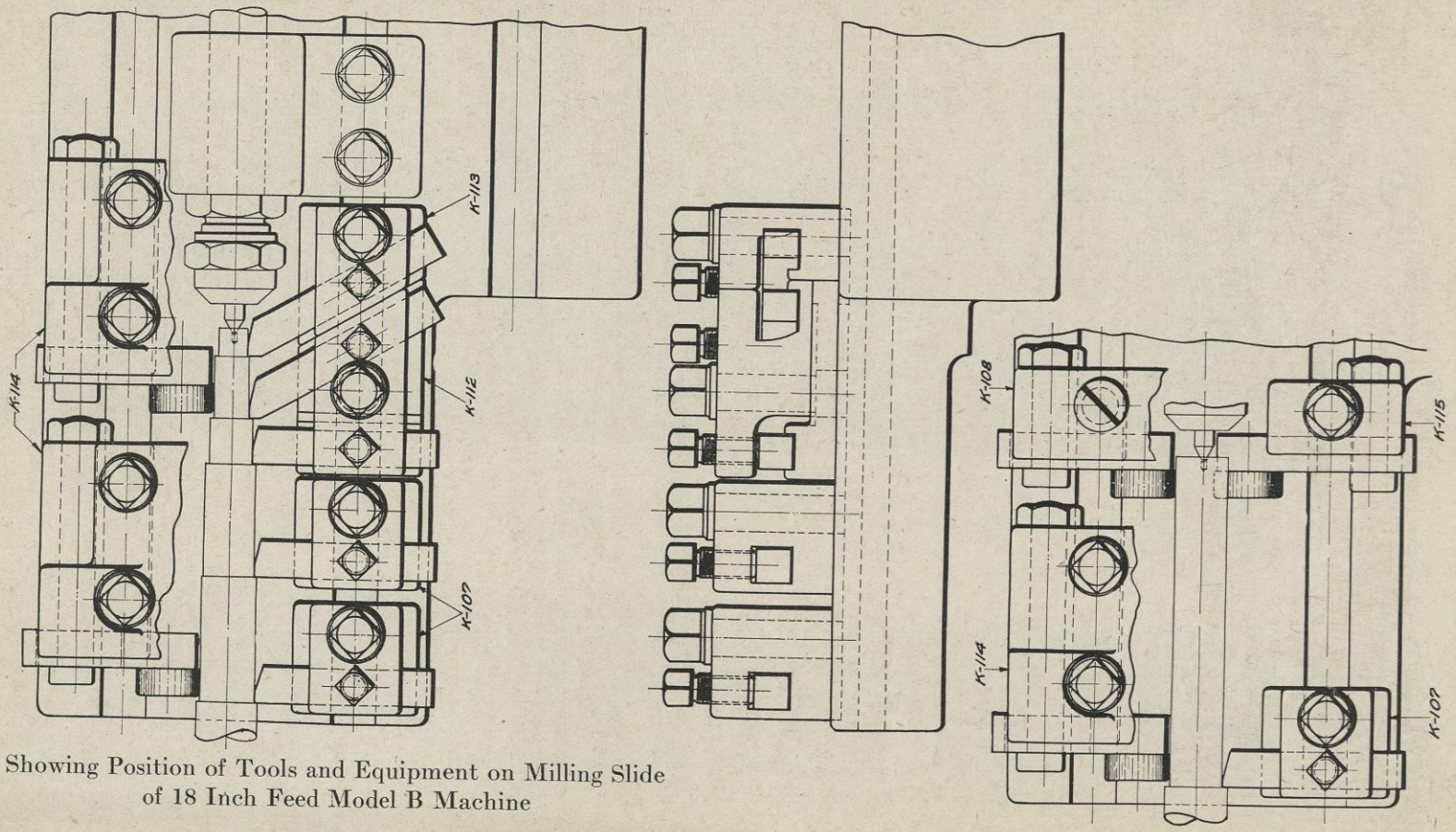
First Operation:—Chucking by hand and the diameter grooves and face rough turned. The piston is then taken from the machine and treated according to the regular shop practice.

Second Operation:—The air pressure to the chuck is then reduced about 2-3 by adjusting the compensating valve, the piston rechucked and the diameter is then finish turned, one set of cross slide tools reform the grooves to within about .008 of size while the second set will finish to exact size and the piston centered for grinding.

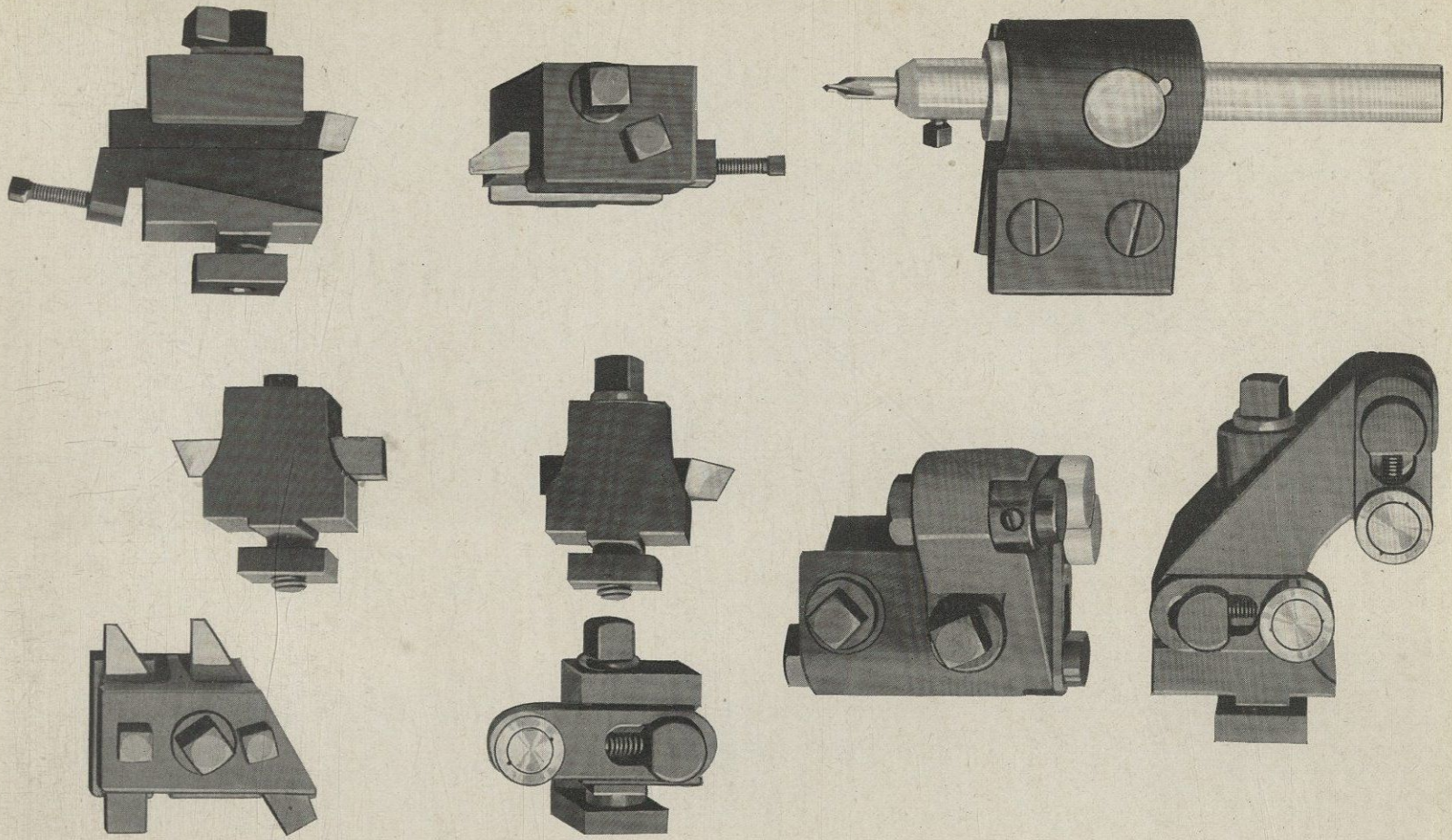
The operations are all simultaneous and produce a piston both accurate and smooth.

The air chuck is attached to the spindle of the machine and compensates for the variation in diameter or shape of pistons by expanding a series of small jaws, carried in an arbor against the cored wall of the piston or draws the piston against an adaptor fitted to the spindle proper. When the operation is complete the lever shown at the left is reversed, changing the air pressure to the opposite end of the air cylinder releasing the piston, at the same time the air is admitted to the brake cylinder shown above the spindle driving pulley causing the spindle to be stopped quickly, and without loss of time.

The machine is capable of machining pistons from cast iron, lynite or any other material, and producing them at the minimum cost.



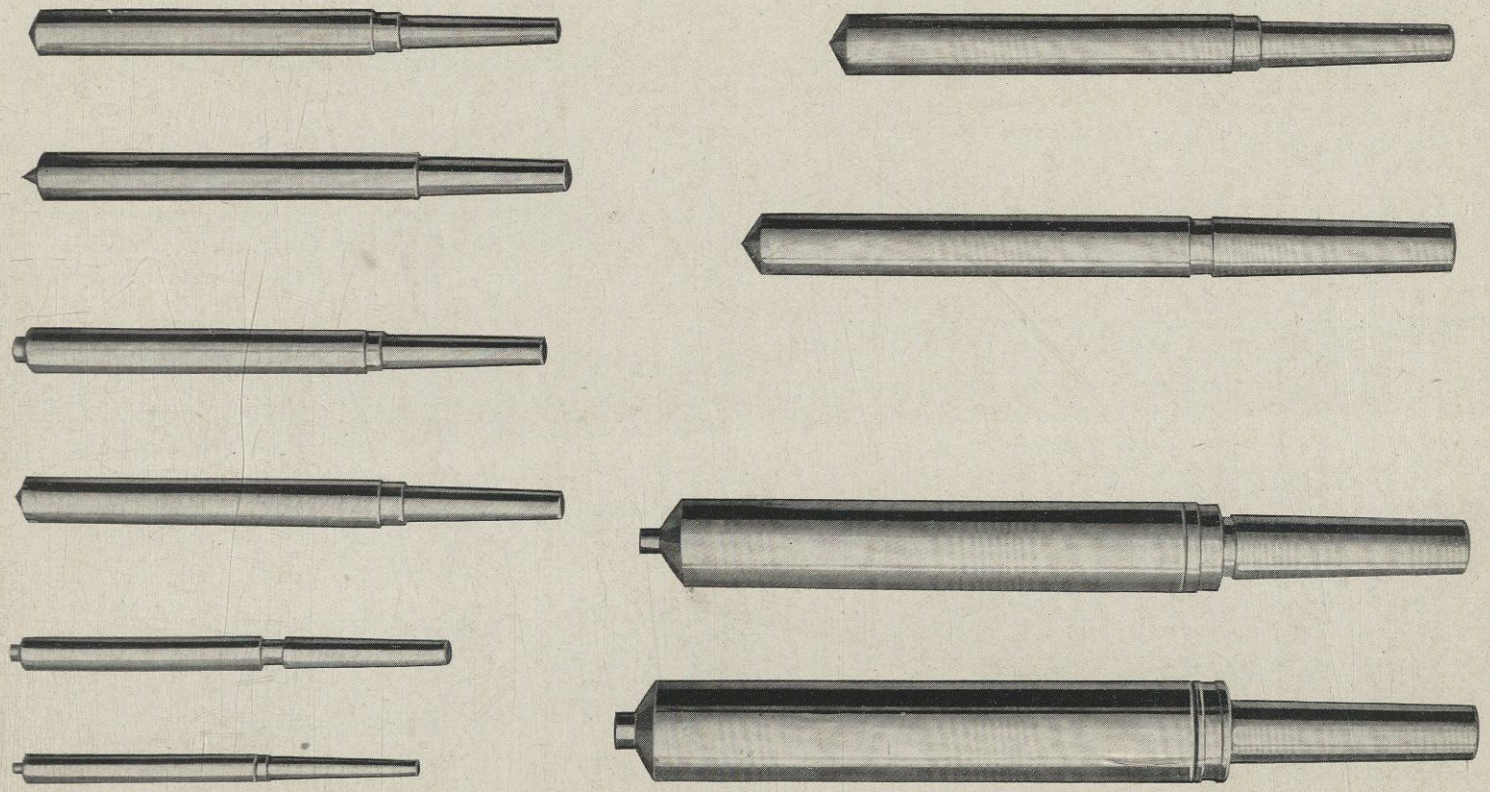
Showing Position of Tools and Equipment on Milling Slide
of 18 Inch Feed Model B Machine



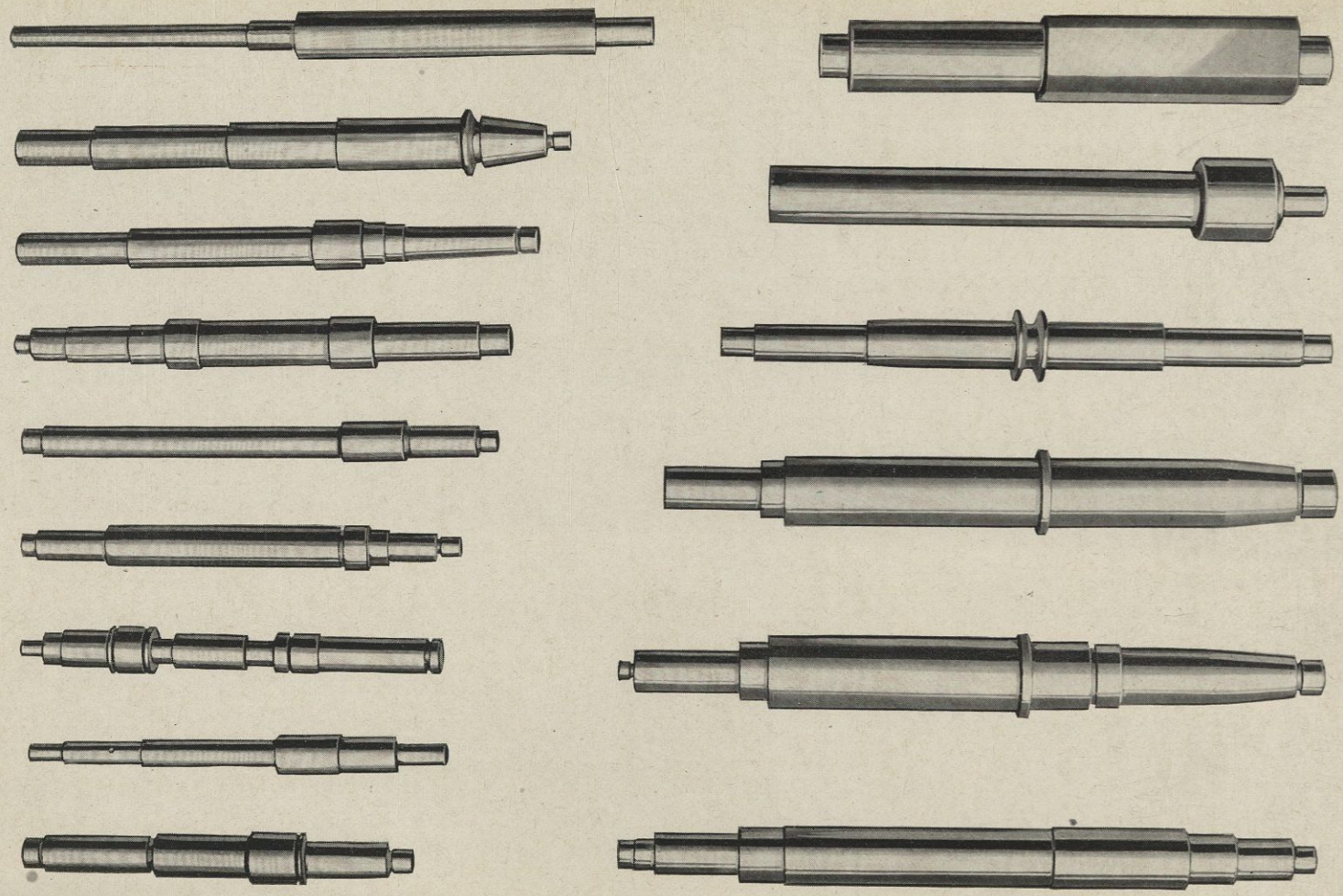
Tools and Equipment for Shafts and Drill Blanks—18 Inch Feed Model B Machine

Shaft Machine Features

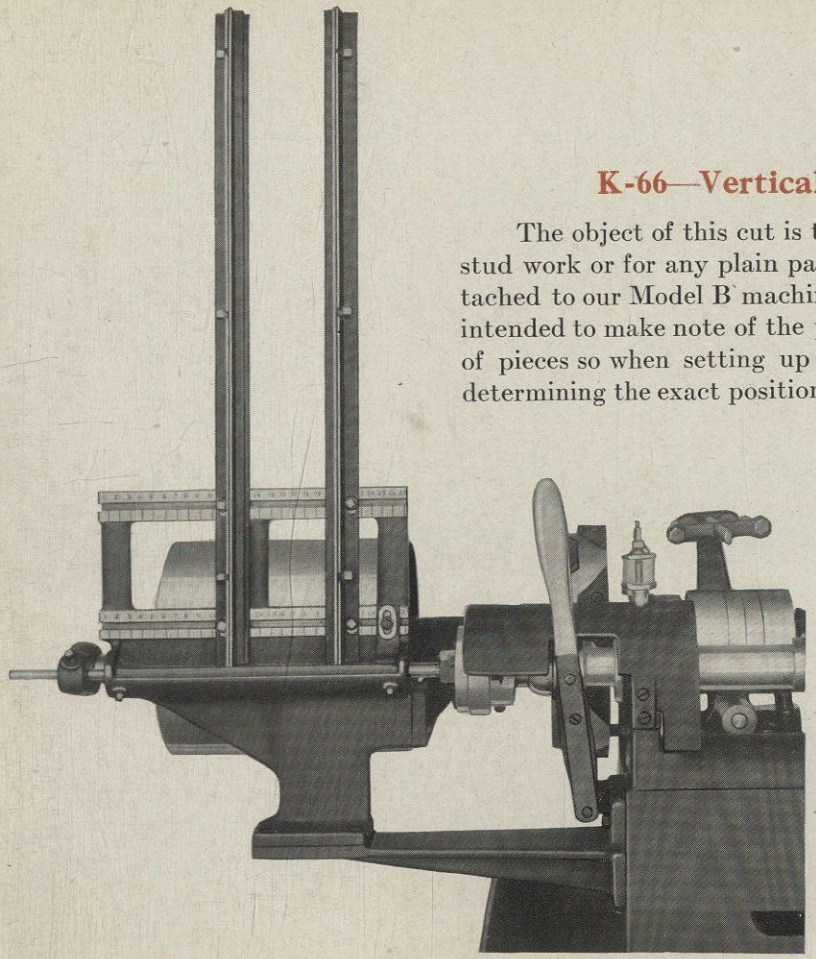
We are calling your attention to our Model B 18-inch feed machine. On page 146 we show the tools in position on slide; page 147 views of the tools that are separate, and on page 149 drill blanks, and on page 150 shafts. We show the tools in position in order to give you an idea how they are located for different classes of work and separately on 147 to get it into your minds how simple these tools are. They can be adjusted longitudinally or transversally very rapidly and produce as we have already said, drill blanks, shafts and various other pieces in the extreme minimum time. This machine will produce parts from 1-16 inch in length up to 18 inches, and a great variety of shapes.



Drill Blanks Produced on 18 Inch Feed Full Automatic Machine-Model B



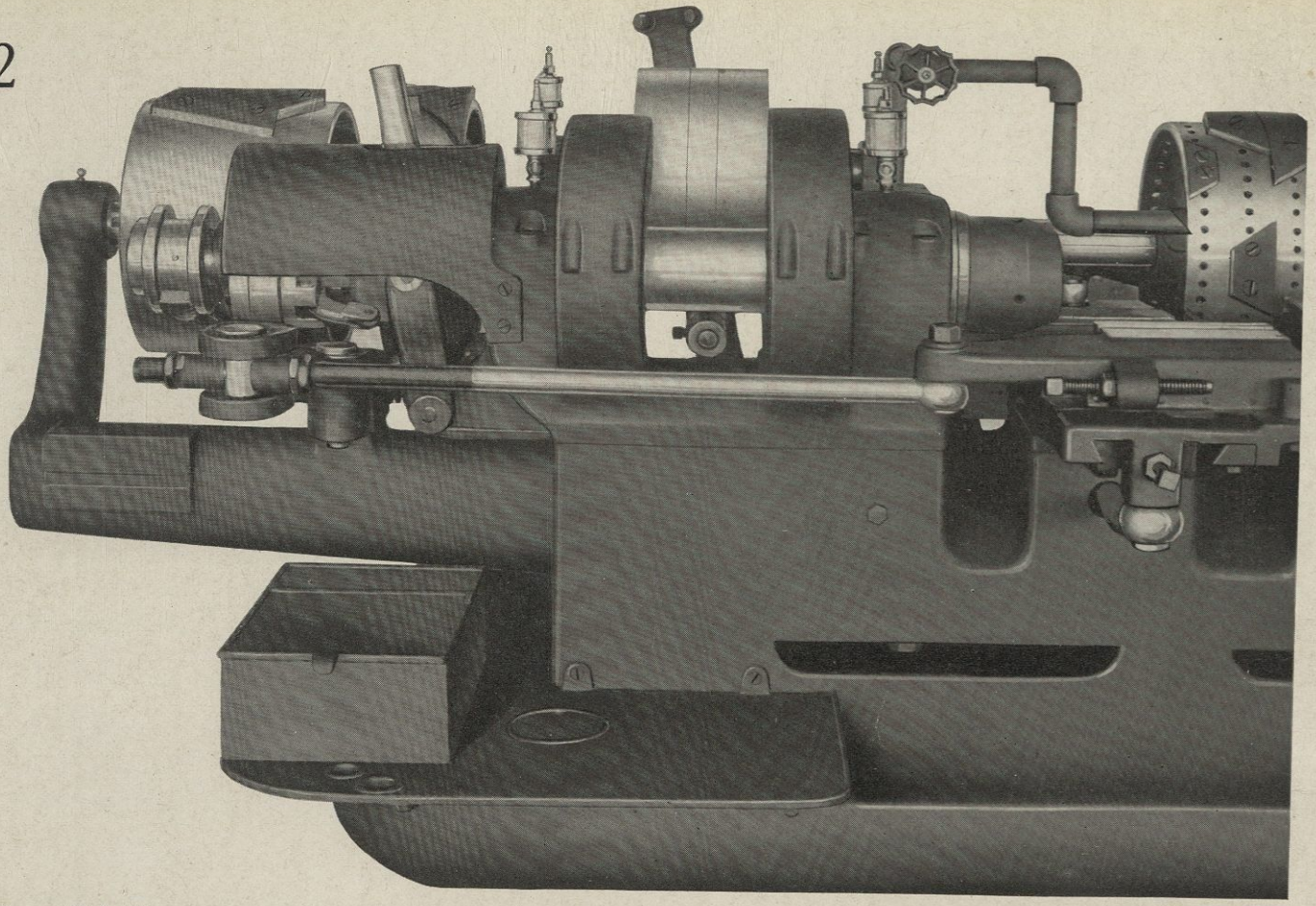
Shafts Produced on 18 Inch Feed Full Automatic Machine-Model B



K-66—Vertical Model B Magazine Attachment

The object of this cut is to show you the simple mechanism of a magazine for stud work or for any plain parts that you wish to have machined, and can be attached to our Model B machine. The figures just visible on the light surface are intended to make note of the positions of the two upright bars for certain lengths of pieces so when setting up on the same job later on you will have no trouble in determining the exact position of these bars. The bars can be moved in any location desired and all that is necessary is to place the plain parts, studs or otherwise, in between them, filling to the top. The rod shown at the extreme left has a longitudinal movement and as each piece drops into the bushing located below the two bars, this rod advances the piece through the spindle, carrying the first one against the gauge stop of the machine. This means that the spindle from the chuck hood back as well as the magazine is filled with the pieces you are operating on.

We wish to call your attention to the simplicity of this whole mechanism.



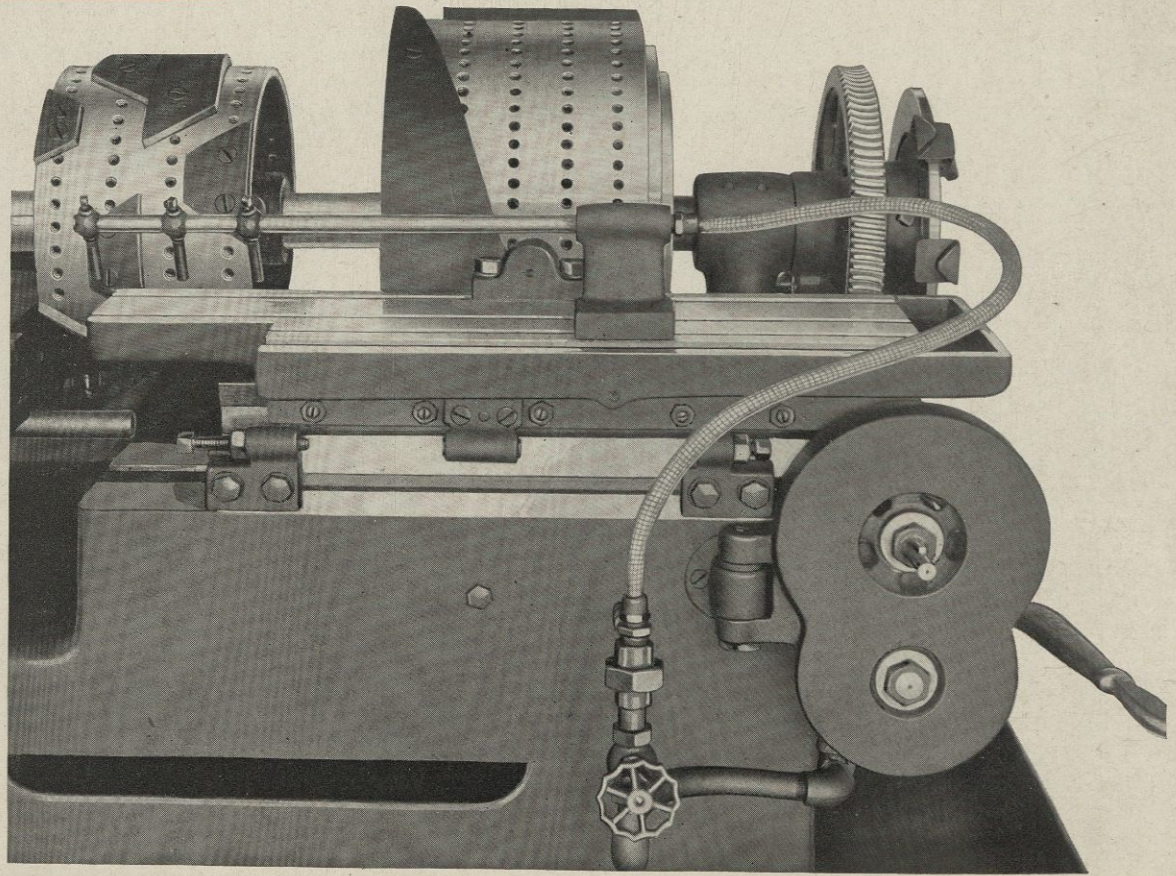
K-77—Cross Slide Taper Turning Attachment for Model B Machines

K-77—Model B Turning Attachment

We show here a turning attachment for producing diameters on the end of the piece close to the chuck hood of the machine, or for turning tapers, as this attachment can be swung on the top of the cross slide at different angles and locked.

If, for instance, you have a shaft that has one or two shoulders on the inside end that are too long and too small in diameter to use a forming tool, or they might be tapered at that end, then this attachment is exceptionally useful. Tool blocks holding the cutters are placed on the auxiliary slide in the proper relation to shoulders to be produced and sunk to depth by regular cross slide movement, then moved along longitudinally towards the chuck hood by means of the connecting rod shown on front of the spindle head, using a lever, visible at the left side of this cut, the invisible end of which carries a roller that engages cams on the drum on end of cam shaft. This can be cammed up for any desired length up to four inches and for any kind of material.

All our Model B 18-In. feed machines are arranged in this manner. We tool this machine for a vast number of pieces that have shoulders on the inside end of shaft and with the aid of this attachment we avoid a second operation.

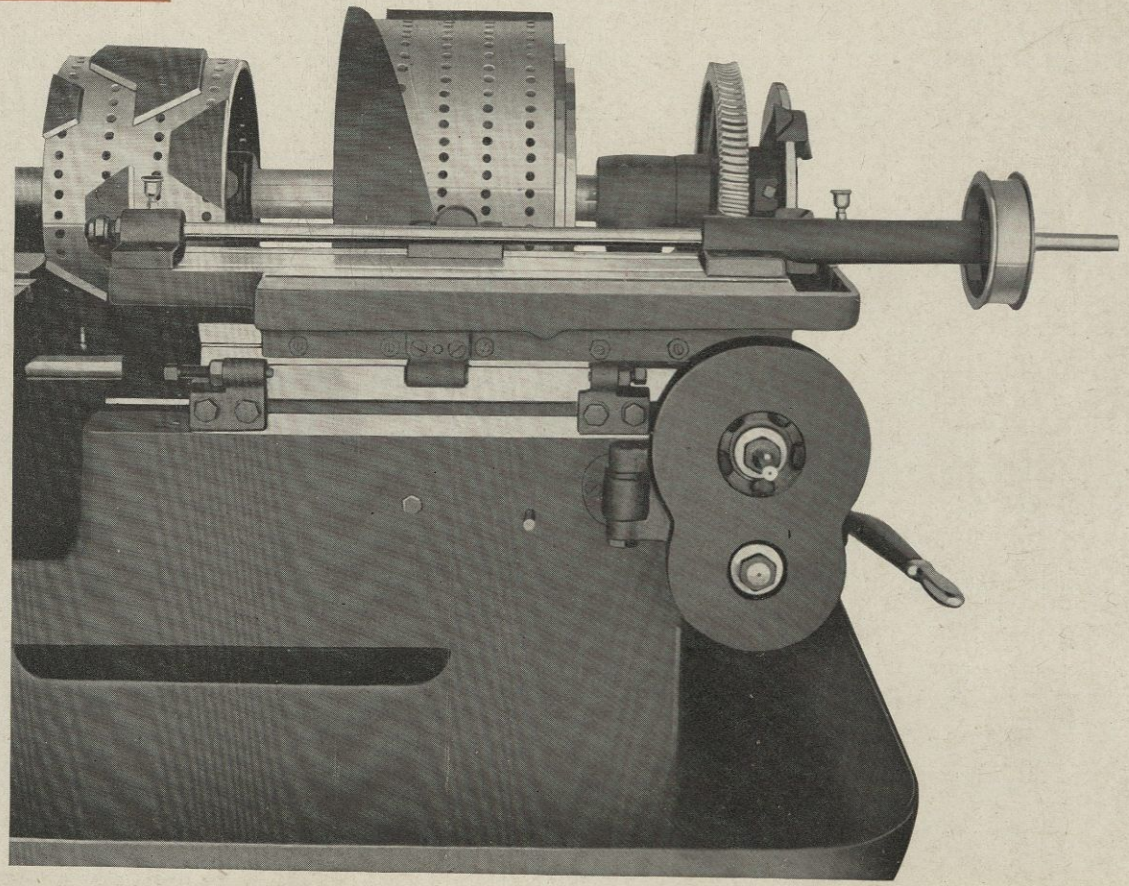


K-54—Oil Feed Attachment for Model B Machine

K-54—Model B Oil Feed Mechanism

This cut shows oil feed as ordinarily applied. It is composed of a flexible tube attached to oil pipe leading from oil pump, to the end of tube that conveys the oil through the hole in the shank to tools. We can have as many streams of oil as desired direct on turning tools.

We have an automatic shut-off device consisting of an oil cock having a special four-pointed star on stem, which is turned to either shut off or open the oil cock by means of adjustable pins, which are mounted on the cam drum. This is an extra attachment supplied with oil feed on Model B machines only where required. The parts shown in most cases meet all requirements, allowing the oil to feed through the tools continuously.

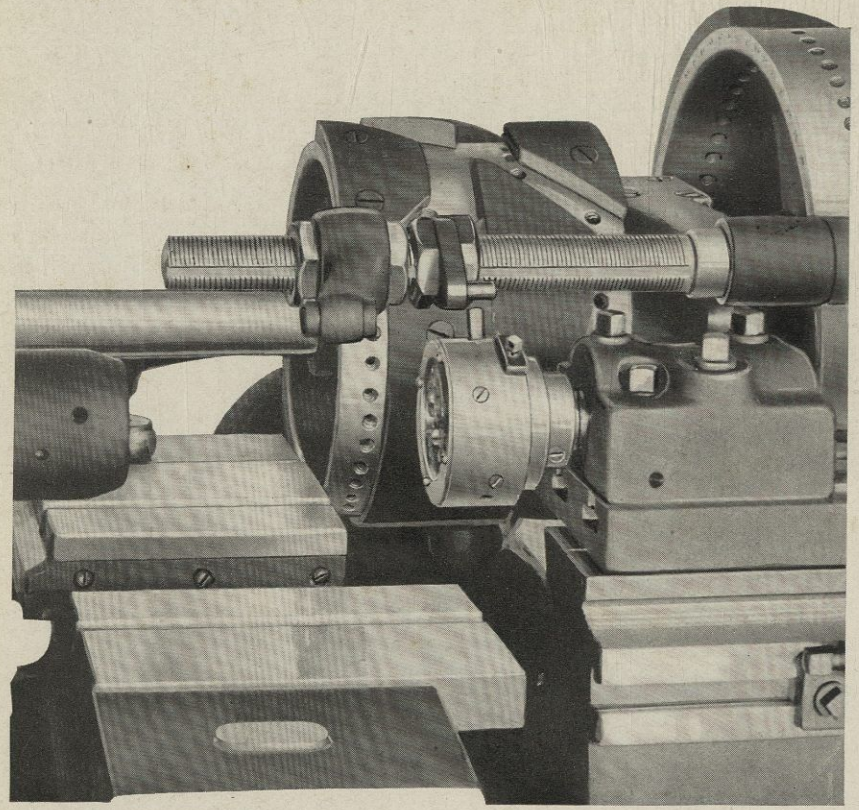


K-79—High Speed
Drilling Attachment
for Model B Machine

K-79—High Speed Drilling Attachment for Model B Machines

This attachment is driven direct from the countershaft and is designed to speed up small size drills and reamers, etc., to the correct cutting speed, regardless of the speed at which the live spindle of the machine is running.

The chuck, which is mounted on the front end of the revolving shaft, extends through end bearing and is keyed to the rear end of this revolving shaft and the belt from the countershaft drives this pulley. The revolving shaft runs in two bronze bushings and there is a ball thrust bearing just back of the chuck.



K-80—Closing Attachment for Self-Opening Die on Model B Machine

The lever mounted on the threaded gauge stop rod, held in place by a nut on either side, closes the die head at the same time the gauge stop operates, it will be seen that the rotation of the threaded rod causes this lever to engage the pin in the cam ring of die head, causing it to rotate to the closing position. This lever is driven by a key that fits the keyway in threaded gauge stop rod and is adjustable by means of the nuts as shown, to suit location of die head. This attachment can be used to close any die head of the pull-off type.

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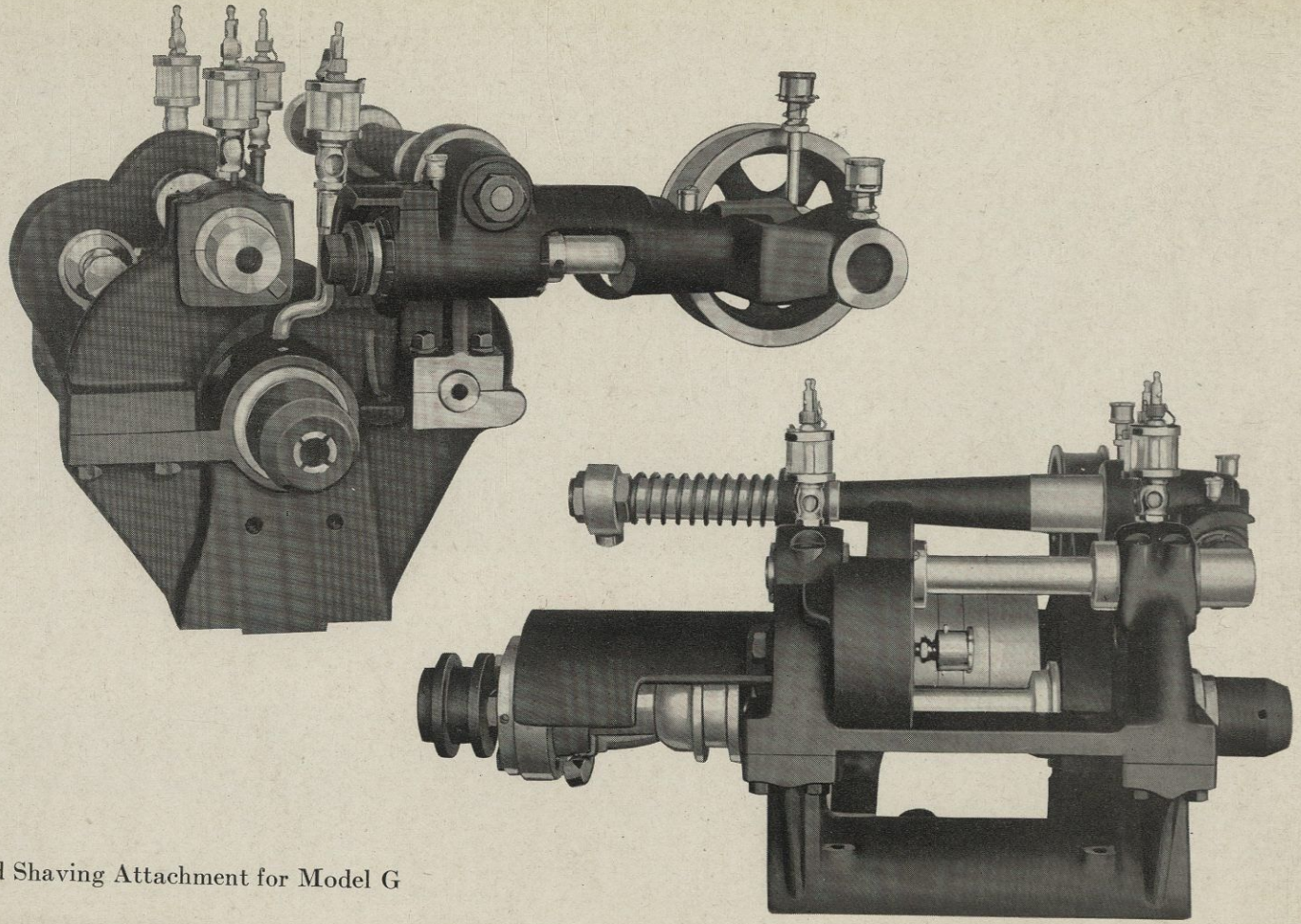


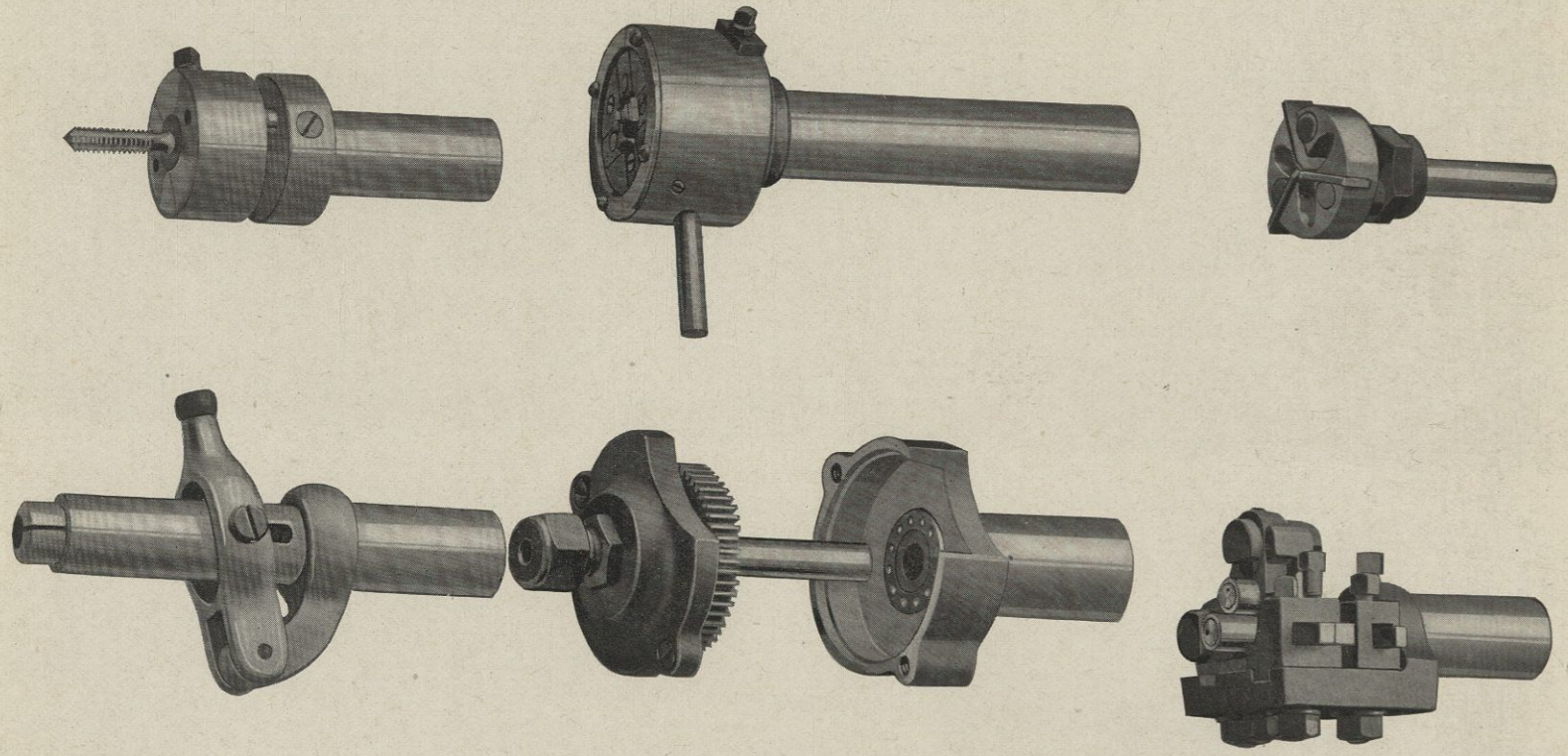
Slotting and Shaving Attachment for Model G

Model G Spindle Head

On the opposite page is the end view of a spindle head of our Model G machine. We wish you to note its compactness. Above the main spindle is the auxiliary spindle. This spindle carries a tool of any description for a second operation, such as threading, drilling, counterboring, shaving, etc.

On the right we show our slotting attachment. On this machine we can perform all the operations possible with the turret and cross slide tools, conveying the piece to the upper position and slotting, then carrying it over the auxiliary spindle and performing any of the operations mentioned. In many instances this completes the piece and does away with the second operation.

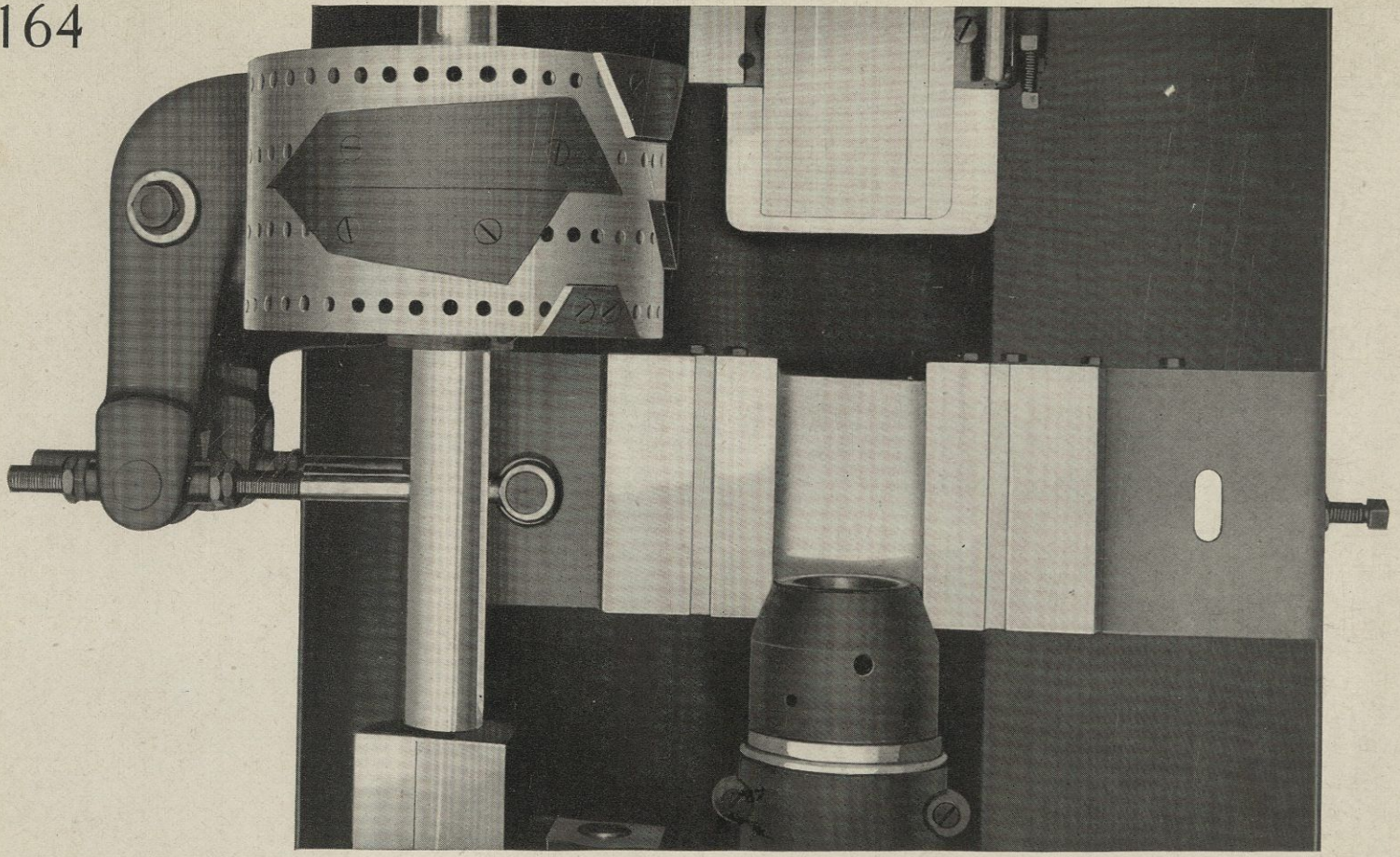
Notice the side view of the same spindle head. The object of showing these two views is to get clearly into your mind the kind of spindle head used on this type of machine.



Tooling for Model G Machine

Tooling for Model G Machine

Here we show a tap holder, self-opening die and shaving tool, also a conveyor which is operated automatically, using spring collet to grip the piece when it is separated from the bar carrying it to the upper position to slot and shave. A high speed drilling attachment with ball thrust bearing and a shaving mill are shown to the right of the conveyor.



K-57—Double Cross Slides for All Models of Machines

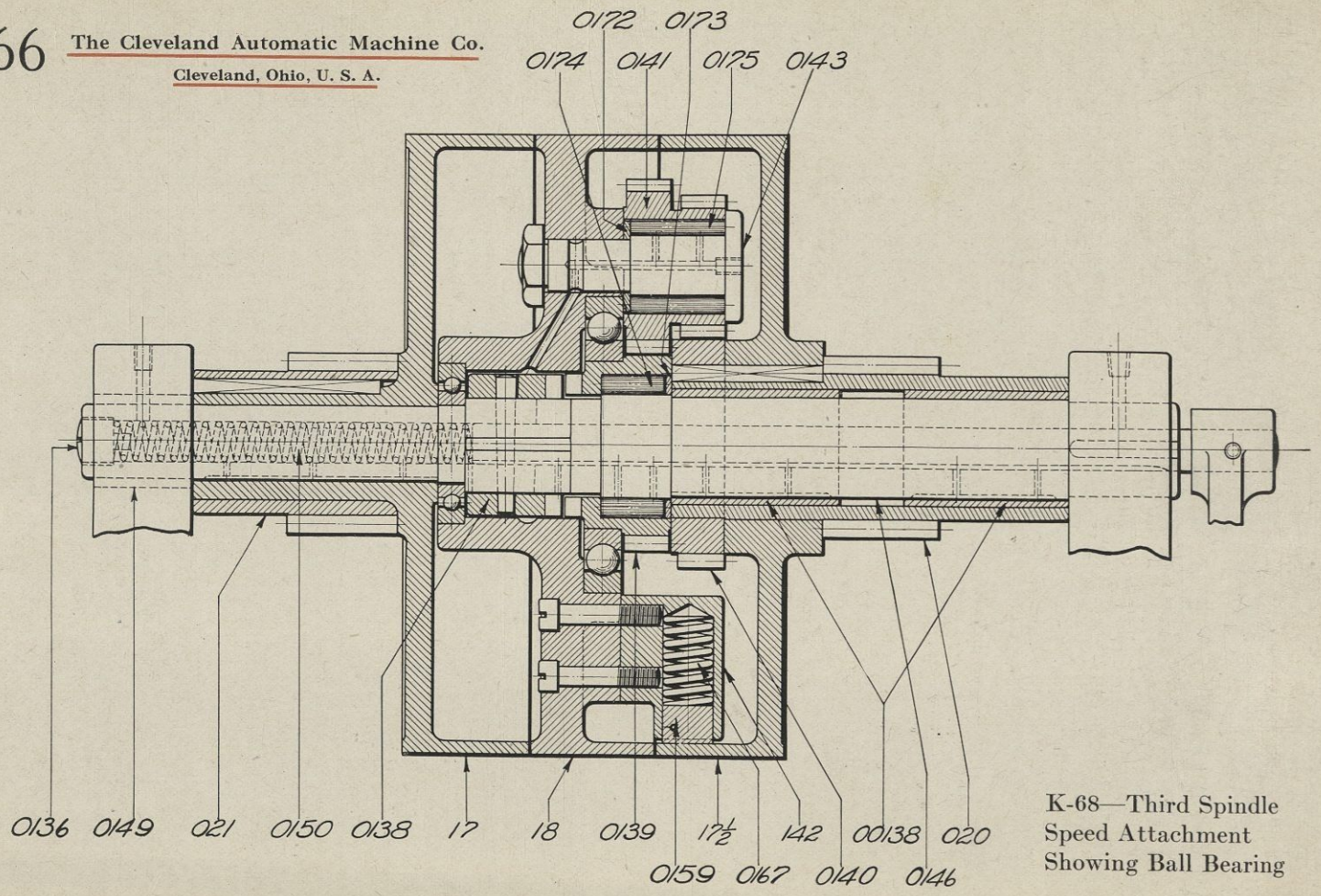
K-57—Double Cross Slides

The front and rear slides are independent, both being controlled by separate connecting rods and bell cranks. The front connecting rod passes underneath both slides and is connected to front slide.

Positive stops are provided to insure accuracy of forming.

Both slides are controlled by cams on cross slide drum. A great number of combinations can be worked out by using this double cross slide and many pieces can be finished complete that would otherwise require a second operation.

When forming with one slide, before the forming tool has completed its work, the cut-off is advanced from the opposite side and in position to work. This eliminates all lost time between forming and cut-off operations. The independent cut-off attachment can be used in combination with double cross slides to cut off when both slides are employed by other tools.



K-68—Third Spindle Speed Attachment Showing Ball Bearing

Third Speed

This attachment is contained in the driving pulleys on the back shaft of the spindle head.

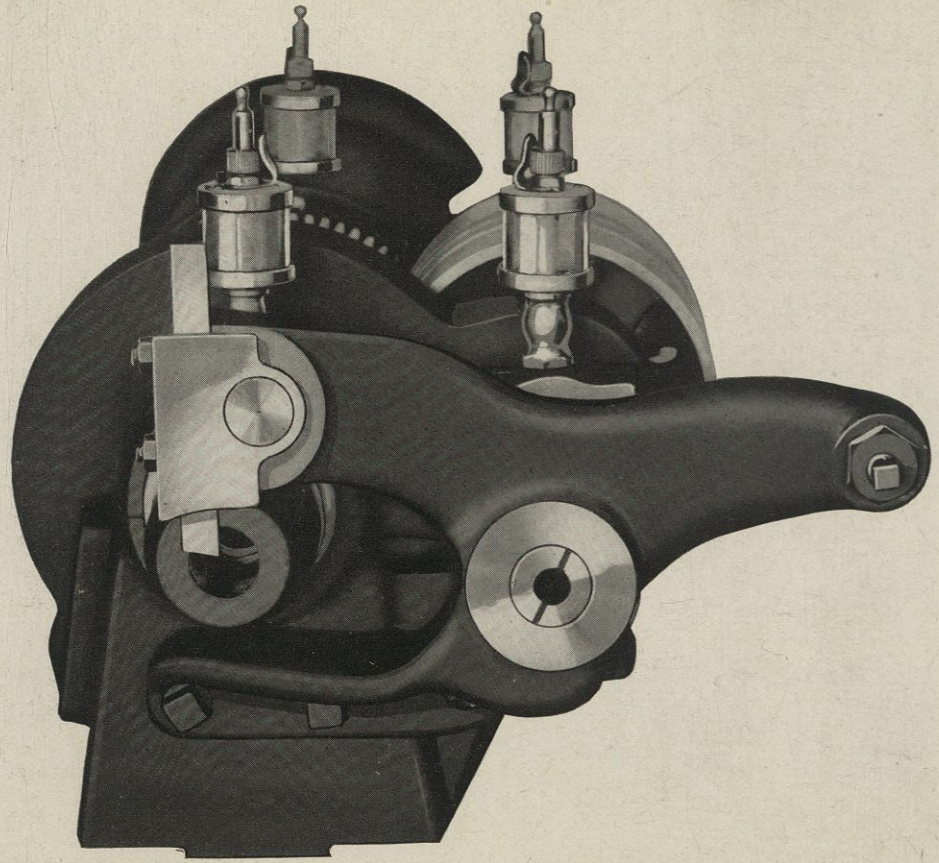
The pulleys at right and left can be arranged to give, with single belt, speeds to suit box mills or forming tools, while the center pulley shown mounted on annular ball bearings gives a powerful drive for thread cutting or any operation requiring slow movement of the spindle and great power.

The operation is as follows: The belt is shifted to center pulley; next an adjustable cam mounted on the cam shaft operates the clutch which is mounted on the main shaft in the hub of the center pulley by means of the arm and rod passing through the center of shaft. This clutch holds the gear stationary, which has the largest ball bearing mounted on its hub, causing the planetary pinion on a stud in center pulley to rotate the pulley at the right through the medium of the different gear ratios of the planetary pinion which meshes with the gear held stationary by the clutch and the gear keyed to the hub of the pulley to the right which drives the front spindle gear. When the clutch is thrown out by the cam on cam shaft the stationary gear is released and rotates on a roller bearing with the center pulley allowing the belt to be shifted as with a loose pulley. (**The clutch should always be out when the belt is shifted on or off the center pulley.**)

A sight feed oil cup mounted at each end of the shaft lubricates the entire attachment. The pulleys at right and left are oiled from the center of the shaft by the holes shown by dotted lines on lower side of shaft, while the planetary pinions are oiled by centrifugal force from the annular groove in the center pulley hub.

K-71—Independent Cut-off Attachment

This cut shows an end view of a spindle head with our independent cut-off attachment in position. We use in this attachment an ordinary flat blade, ground all over, and by studying the cut you will see that the cut-off merely swings back and forth. It is now in position with the blade near the center. After the piece is separated from the bar it is tilted back by means of a cam on the cam shaft, that comes in contact with the roller on the right extreme point of this cut. It is merely moved back and forth at any time desired. There is no mechanism about it to cause any trouble whatever, and it can be arranged for different widths of blades. When not in use it stands out clear of everything. This attachment is adaptable to all models except Model H which requires a different attachment.



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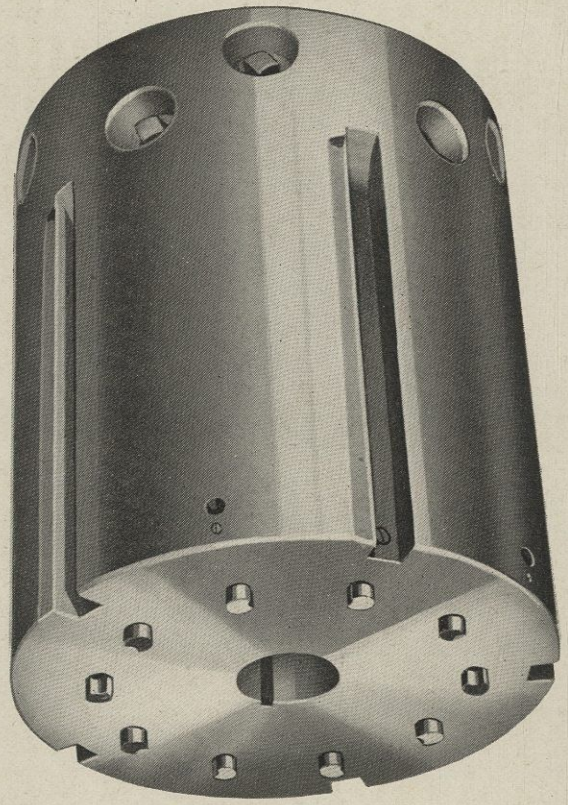
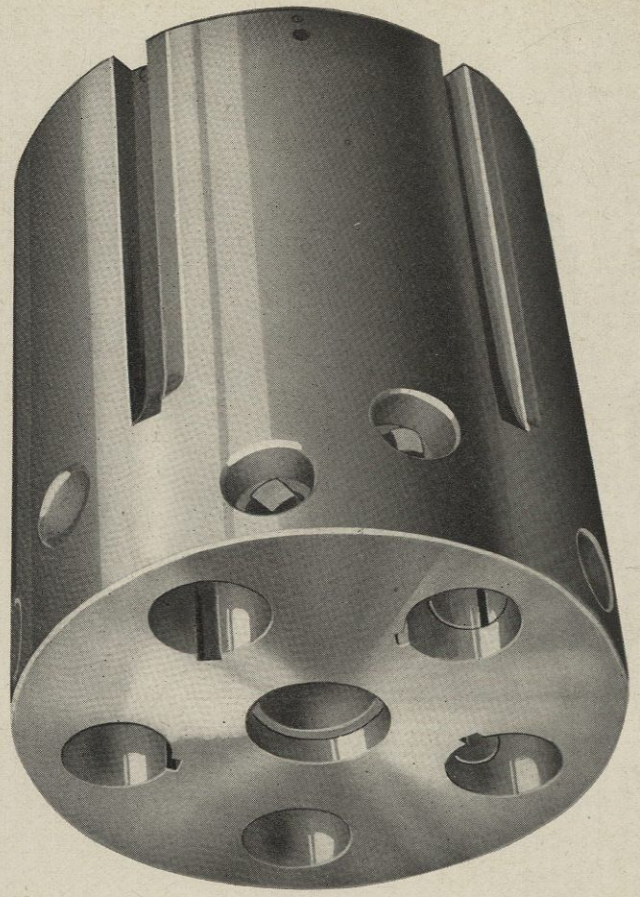




Views of Turrets for Model A Machines

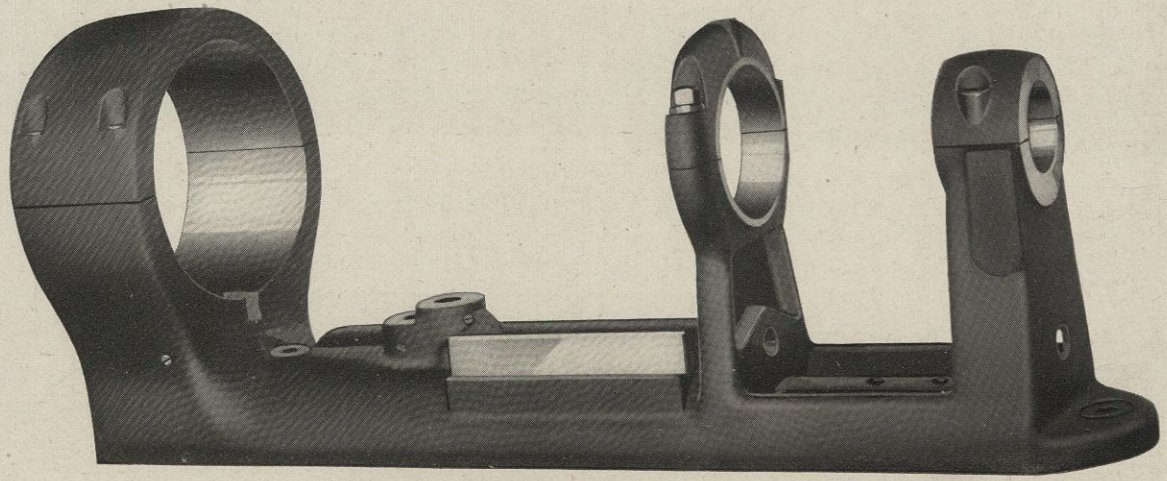
Cleveland Turrets

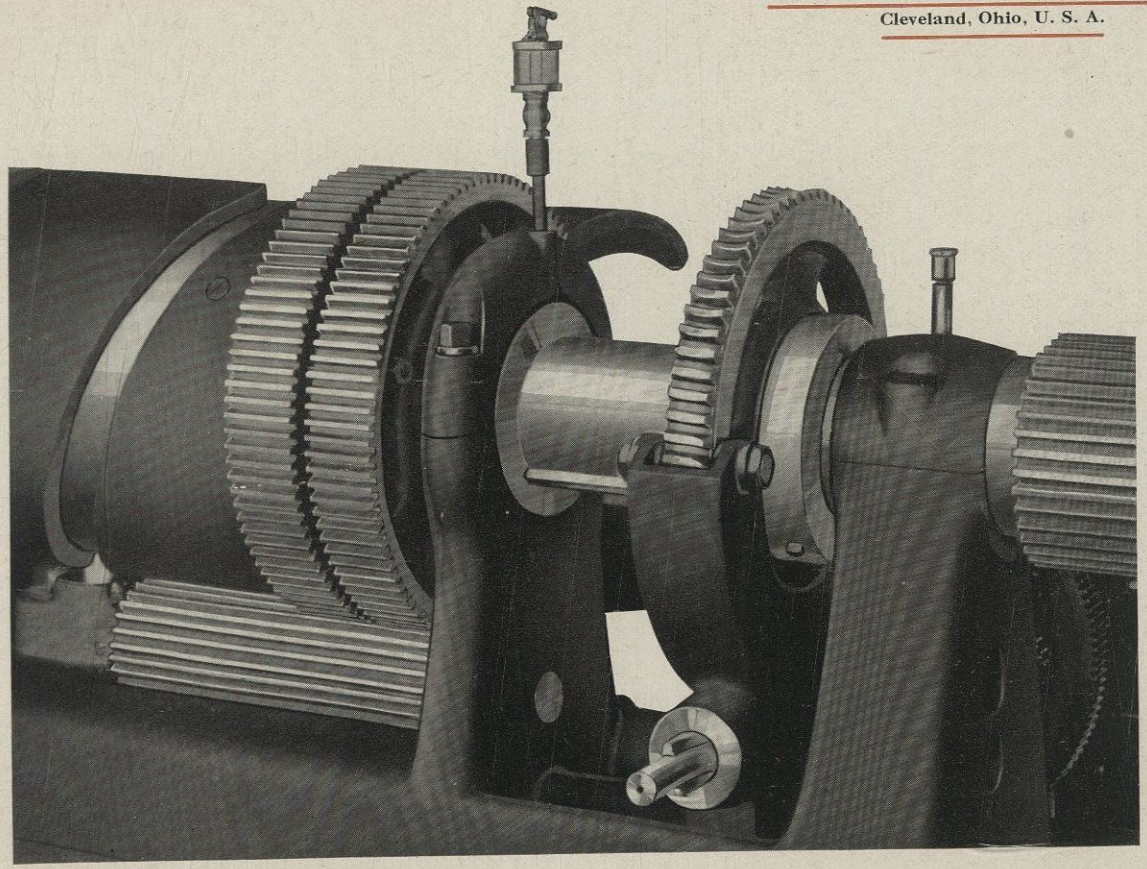
The object of showing this cut is to get into your mind the idea of the double set of pins in the end of the turret. One of the pins is used for indexing the turret, bringing it to the exact position as the locking wedge drops in. The other pin is to prevent the turret in any way losing its position, or in other words if the turret is rather free in its bearing, after long use it might have a tendency to fall forward, because the tools in some work would be heavier on one side than on the other. With the extra pin we overcome this trouble. The consequence is the turret is always in its correct position regardless of anything that might occur.

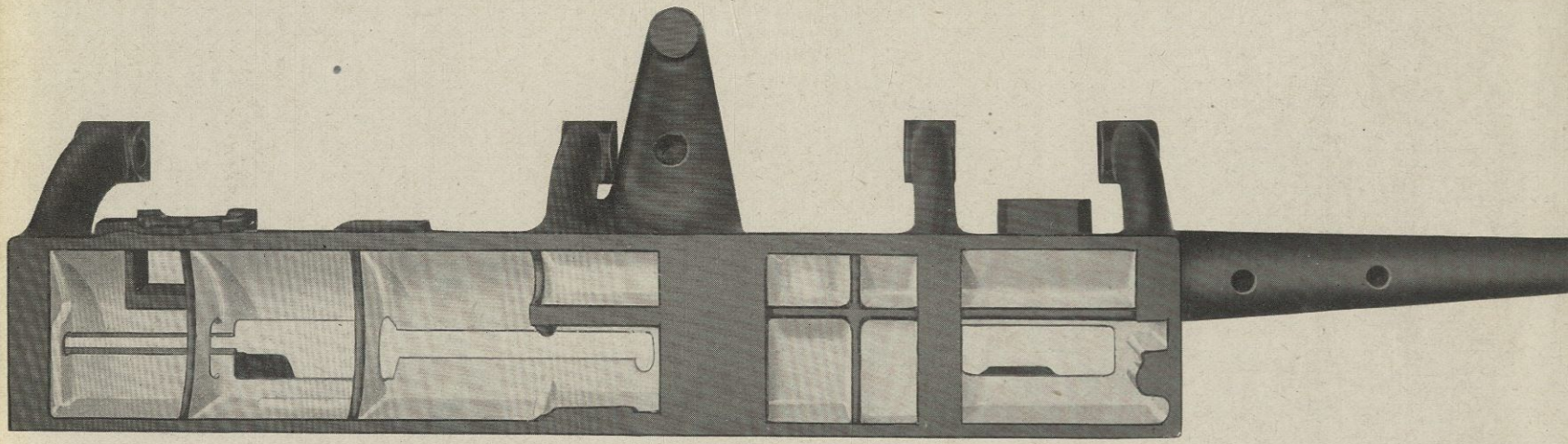
We also show the opposite view of one of our turrets, and wish to say that on all machines of 4¼ to 7¾ inches we have a keyway in the turret tool holes. If we are using enormously heavy tools for removing a vast amount of stock rapidly, the keyway will hold the tools so there is no possible chance of their moving under the heavy strain. We can keyway or flat the stem of the tools to keep them in the correct position regardless of any strain in cutting. In setting up the same job at any future time they will locate themselves as they were in the original set up.

Turret Head

The cut below shows the turret head of our Model A machine, ready for assembling. We wish to call attention to the center bearing that is located next to the cam drum driving gear. This support is only necessary on the larger sizes and takes care of the cam and gear strains, assisting the end bearings in maintaining the alignment of the turret. This is one of the strong points of the CLEVELAND, which leads all other makes in this particular feature. The cut on opposite page shows the assembled head.



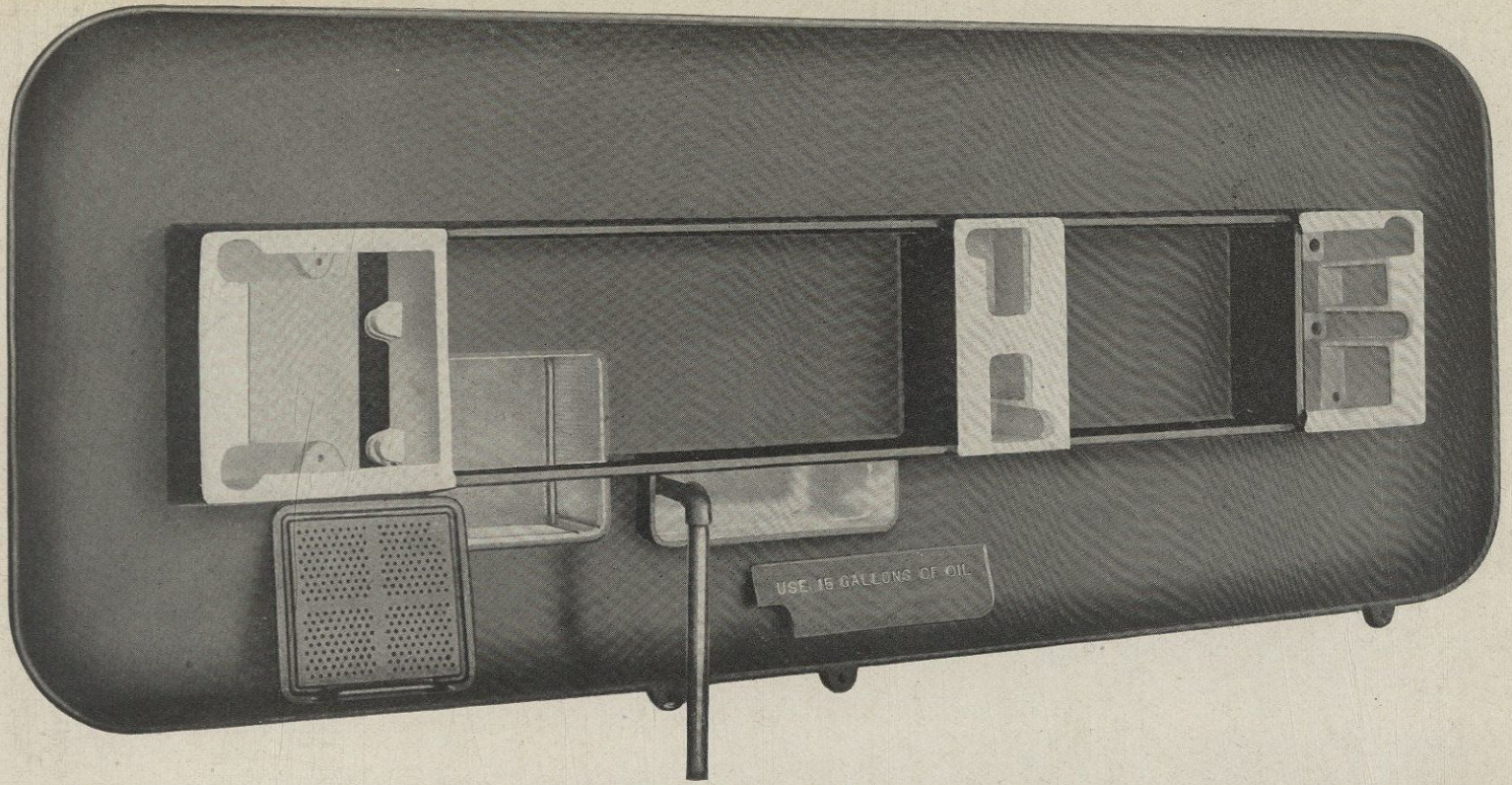




2 Inch Machine Bed

The bottom view of the bed of a CLEVELAND Automatic. The reason we show this is to clearly enable you to grasp how we rib our machines. These ribs or bars are heavy and tie the bed together in all directions. As cast iron in the shell form yields more or less, we have found it necessary to produce castings of this shape. The beds of our machines are exceptionally rigid and have no tendency to lose their shape when standing on the floor or in use.

Bottom View of 2 Inch Model A Bed

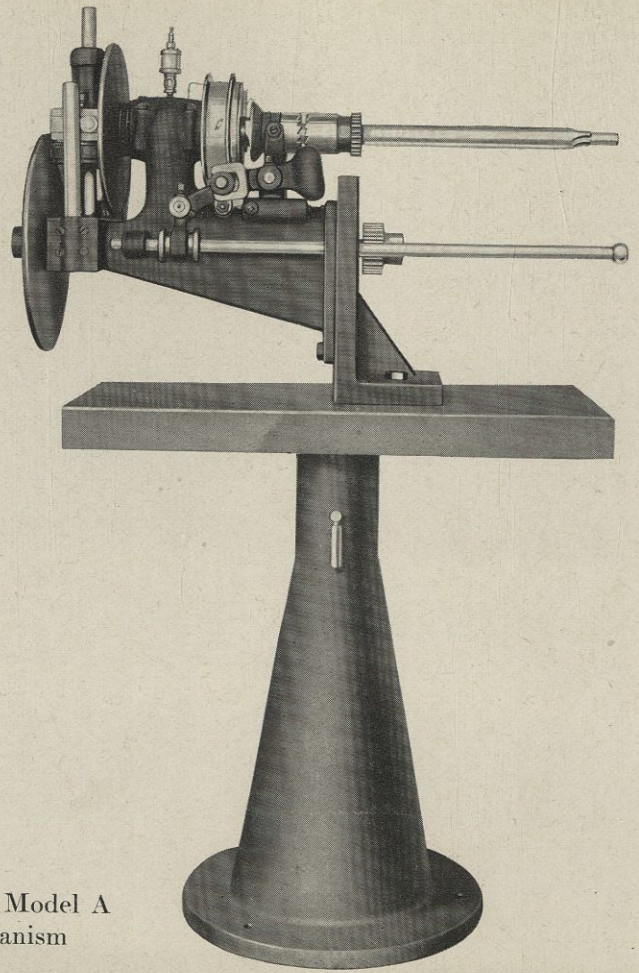


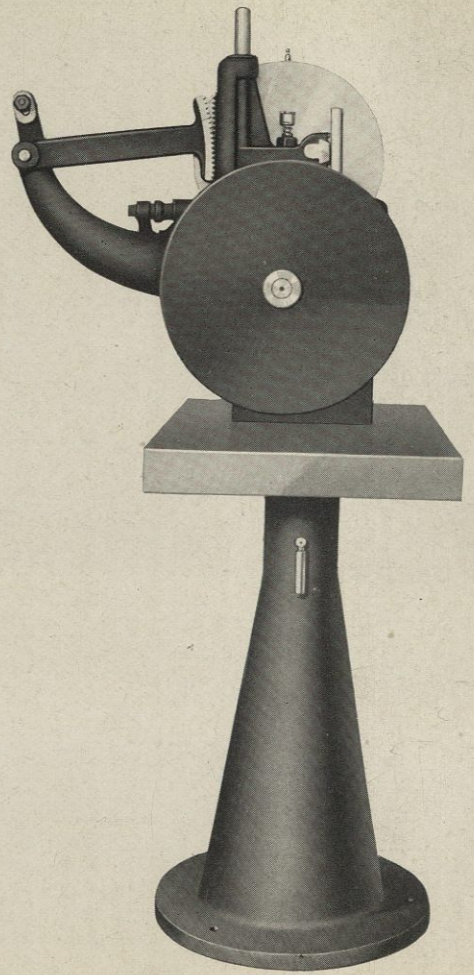
Top View of Pan

In showing this top view of the pan of our machine, we wish to call attention to the care we take to prevent fine chips or other foreign matter in the cutting lubricant from entering the pump or oil feed system. The strainer shown close to the oil reservoir at the left is perforated with large holes, allowing lubricant to pass through freely while the screen in the side of this reservoir has small perforations through which the lubricant passes slowly, allowing foreign matter to settle before reaching the pump well. The pump suction pipe shown in this well is fitted with another fine strainer.

The consequence is the oil passes through three strainers before it reaches the pump and is discharged on the work. The meaning of this is the oil is free from chips when passing through the pump and being delivered on the cutting tools. This gives the pump a longer life as far as the wearing parts are concerned, and better results.

View of Pan Showing Strainer in Center with Oil Pipe and Strainer





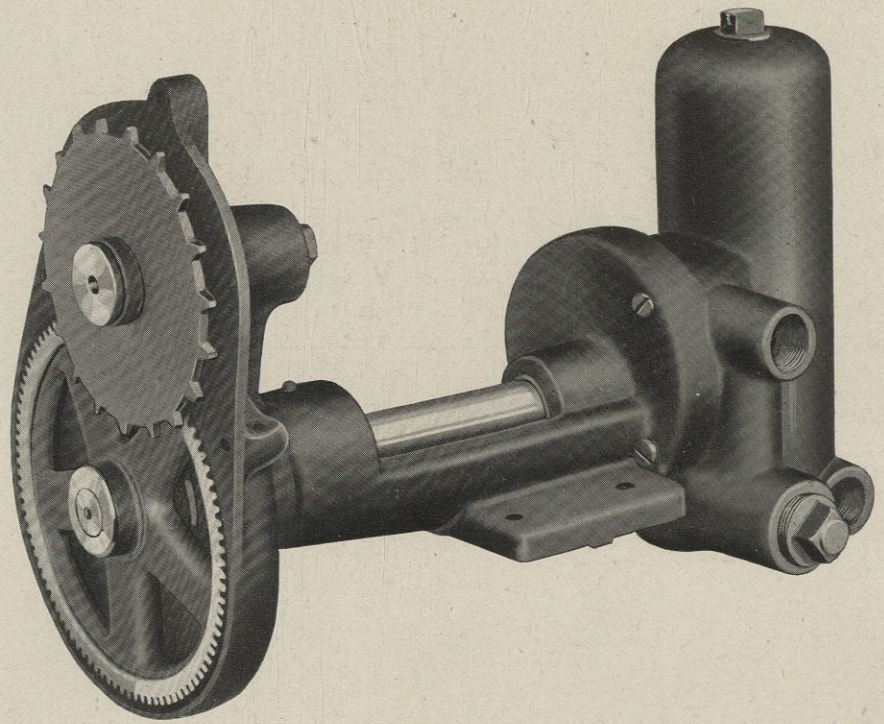
Two Views Model A
Feed Mechanism

Model A Feed Mechanism

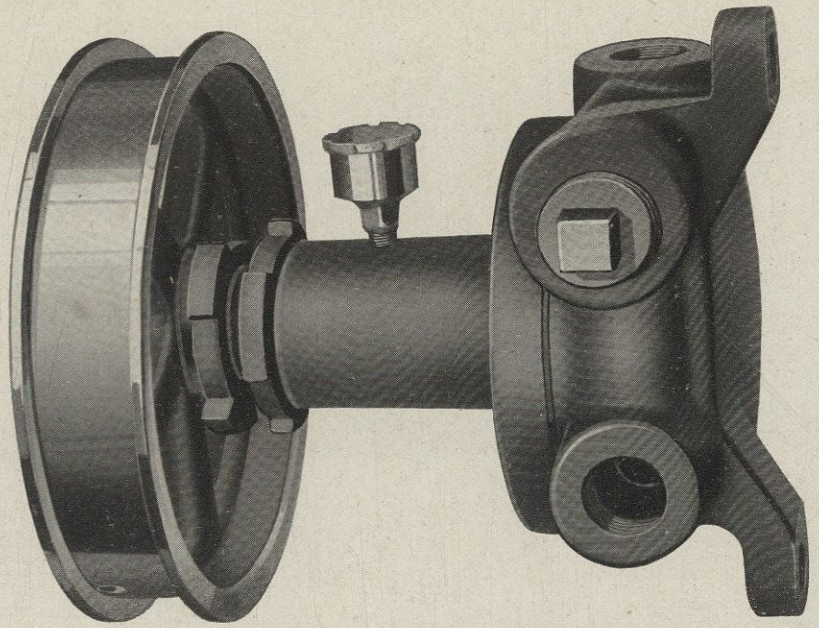
This cut shows a side view of a feed bracket. The vertical shaft between the feed discs is a guide for the roll shown mounted on a slide. A spring under this slide holds the leather roll against the driving disc. The lower disc is fitted with the regular spring, set to less tension since the device described above divides the load and creates a stronger and more positive drive, prolonging the life of the leather roll.

The other view shows our assembling stands, that are the proper height to be convenient and can be swung in any position to suit the workman or obtain better light while fitting parts.

We call attention to this fixture to give you some idea of how we assist our men to produce each unit of the machine with the necessary care and accuracy and at the same time do a fair day's work with ease.

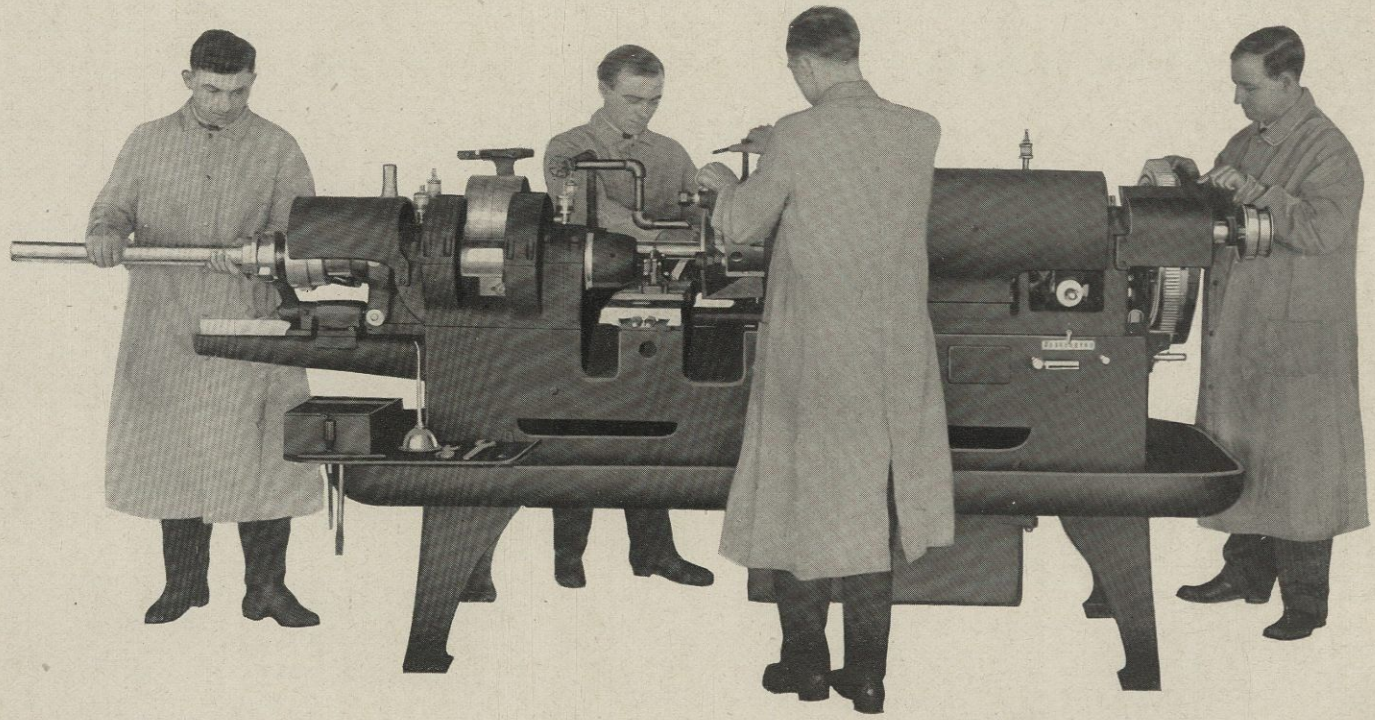


Gear Driven Oil Pump



Our Latest Oil Pumps

The view on this and the opposite page show our Belt Driven and Gear Driven Oil Pumps. The Gear Driven is of great capacity and used on our large machines.



Setting Up a "Cleveland"

Simplicity of Adjustment

Our object in showing the cut on the opposite page is to impress upon the mind of the prospective customer the real simplicity of the CLEVELAND over all other makes of machines. This is something that we constantly advertise and talk about at every opportunity. Of course, the users of our machines understand everything pertaining to their simplicity, but for the benefit of those who never had the opportunity of investigating we show the accompanying cut.

Operation from Left to Right

No. 1—Placing the stock in the machine. Chuck operating yoke to the left enables the operator to open and close the chuck by hand.

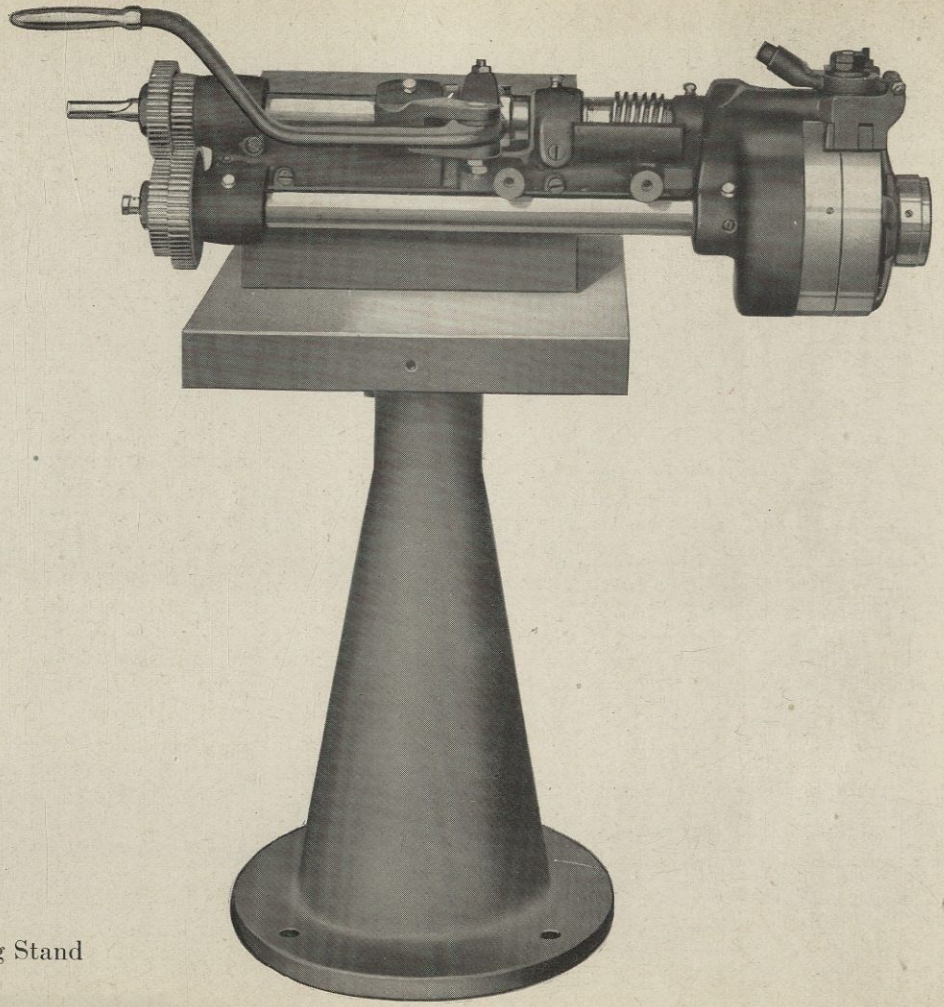
No. 2—This man is standing in position to adjust the cross slide cams and at his right is the belt shifter. Stops are used to insure accurate work from the forming tools.

No. 3—Setting the tools in the turret and cross slide. A lever in the front of the machine, hidden from view by the operator is used for drawing the turret wedge so that the turret can be turned from its position for convenience in adjusting the turret tools. The turret to the right must be brought back to its original position before throwing in the power feed. A half turn of handle to the right throws out the power feed. The machine can then be operated by hand. A crank handle is also used in making longitudinal adjustment of the turret head.

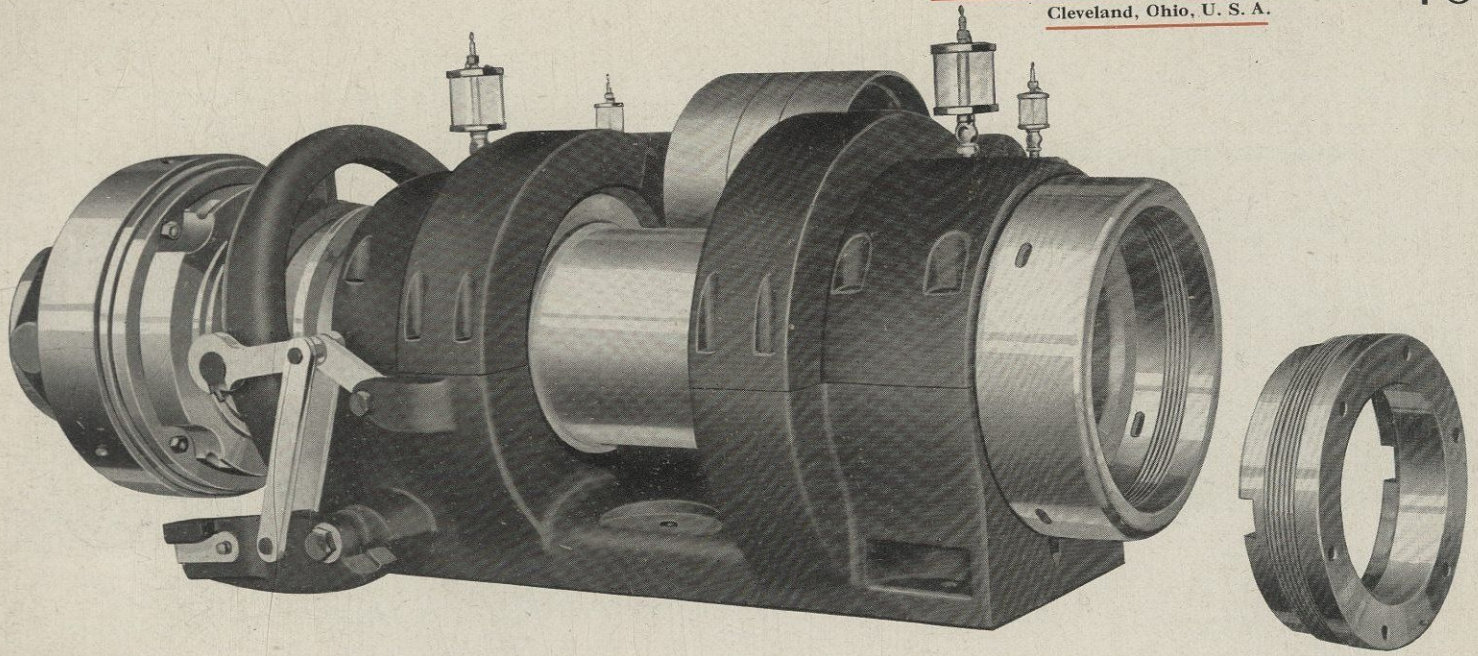
No. 4—The man has his hand on the feed regulating drum, which is the simplest feed control ever used on an automatic, it regulates the feed of all the tools. Cams on the outside of the drum are adjusted longitudinally to accommodate the tool feeds for any kind of material that might be used. Pins seen on the inside of the feed regulating drum are tripping pins for the feed, that can be set in a moment's time to trip from the high speed on the idle movement to the low speed when the tools are actually doing their work. It will be understood that the adjustment of these pins and cams can be made just as well when the machine is in operation as otherwise. This much cannot be said of any other automatic.

We believe that these men placed in their four different positions will impress upon the reader the real and genuine simplicity of operating a CLEVELAND Full Turret Automatic.

This view shows a stand of the proper height for a workman to assemble different mechanisms on our machines. It revolves in any position desired. We use such stands extensively. We show here a Feed Bracket of one of our Model C machines, and by having this stand revolve it means that work performed can always be located in a position to receive the best light. We find a stand of this kind of great assistance, both for the doing of good work, as well as performing the operation rapidly, as time is not consumed in trying to locate mechanism you are assembling to see just what you are doing. This we believe is all important in any line of business.



Feed Bracket for Model C Machines on Assembling Stand

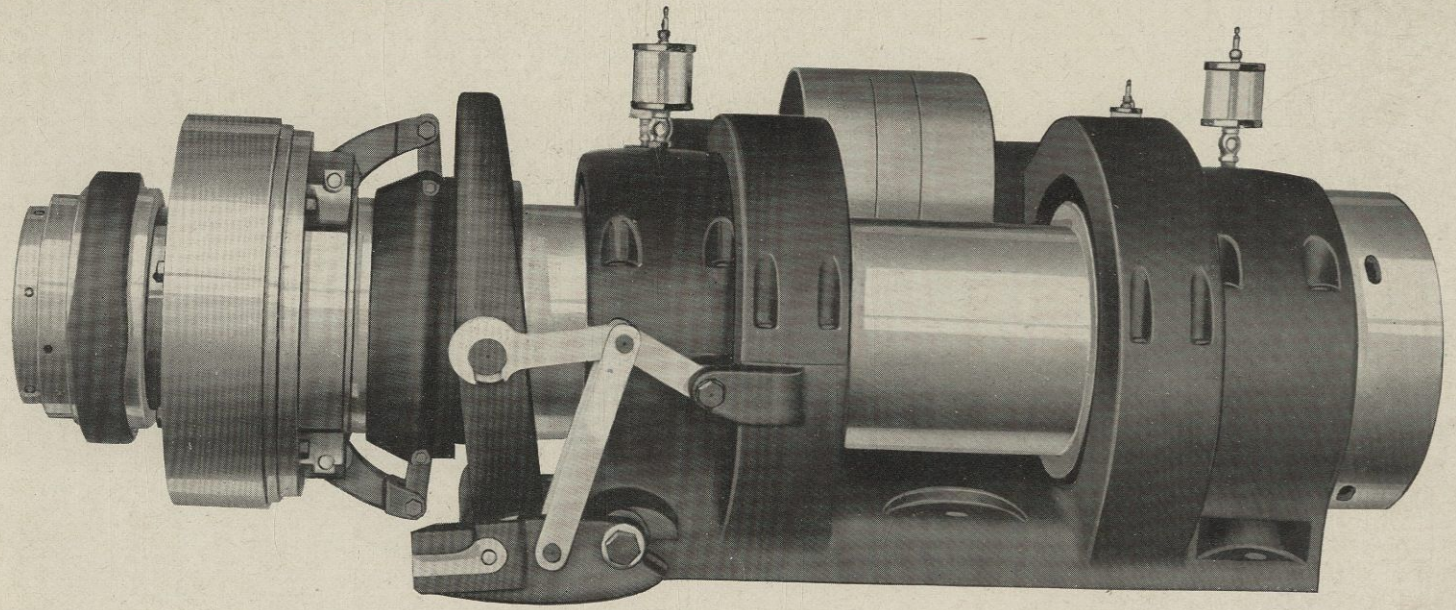


New Design Spindle Head

The view above shows the spindle head used on our 4¼-inch, 5½-inch, 6¾-inch and 7¾-inch automatics. This is something new with us for the reason that we have no hood that screws on the end of the spindle as we do on our smaller size machines, it is all one piece. The inside of this spindle is machined exact to gauge. The piece shown on the outside is steel hardened and ground all over, tapered on the inside to receive the chuck. The strain of the chuck comes against this steel piece rather than against the chuck hood which is used on smaller sizes.

We consider this an extremely up-to-date and rigid construction for the reason that we have but very little over-hang. When using very wide forming tools, our cutting is closer to the main bearing. The merits of this will unquestionably be understood by the reader.

(Continued on next page)



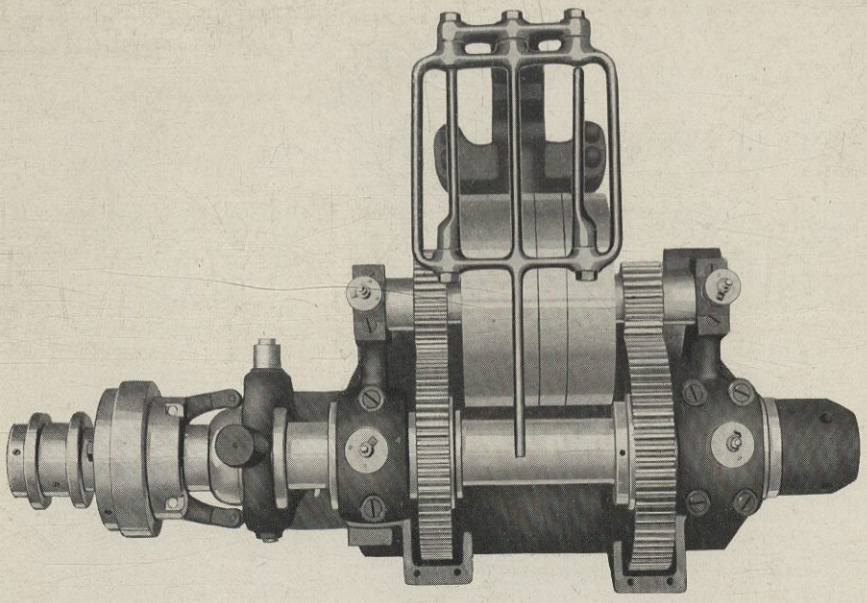
New Design Spindle Head

This view shows the opposite end of the spindle head. The hand operation for opening and closing the chuck is noticeable, and by swinging back the latch after the chuck is set to grip the bar to a disengaged position, then the machine is free to operate automatically.

The toggle shown in the cut on the spindle is designed for great power, which is necessary in gripping a large bar against the resistance of rapid cutting tools, because with this toggle we grip the bar exceptionally firm. This style of mechanism enables us to move the chuck after it is released longitudinally, a much greater distance than the style of machines previously used by us, leaving a space on our large machines of practically 1-16 inch of clearance on the side of the bar.

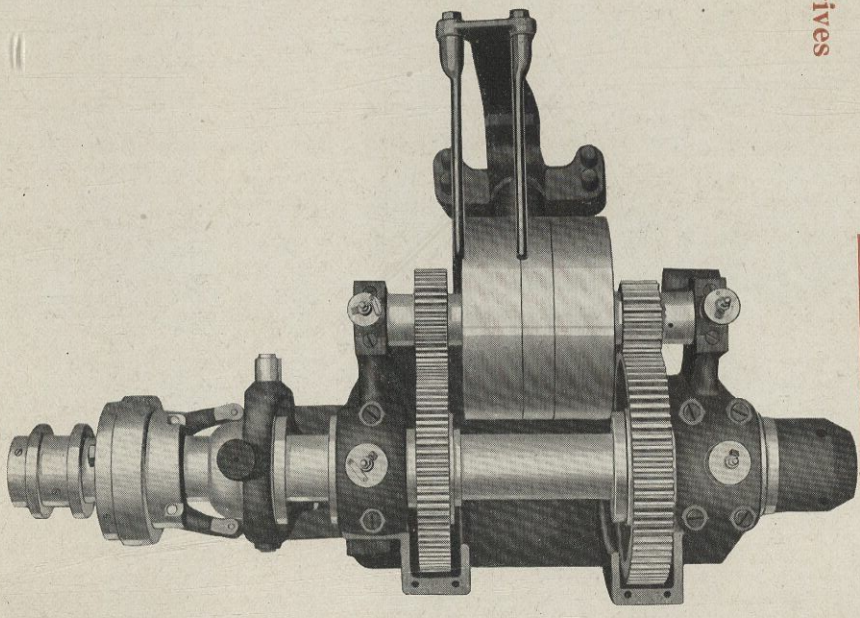
The object of explaining this is to show that we can handle with our large machines, regular commercial, rough, black bars and the variation in size will cause us no annoyance. We consider this exceptionally important on a large automatic.

Spindle Drives



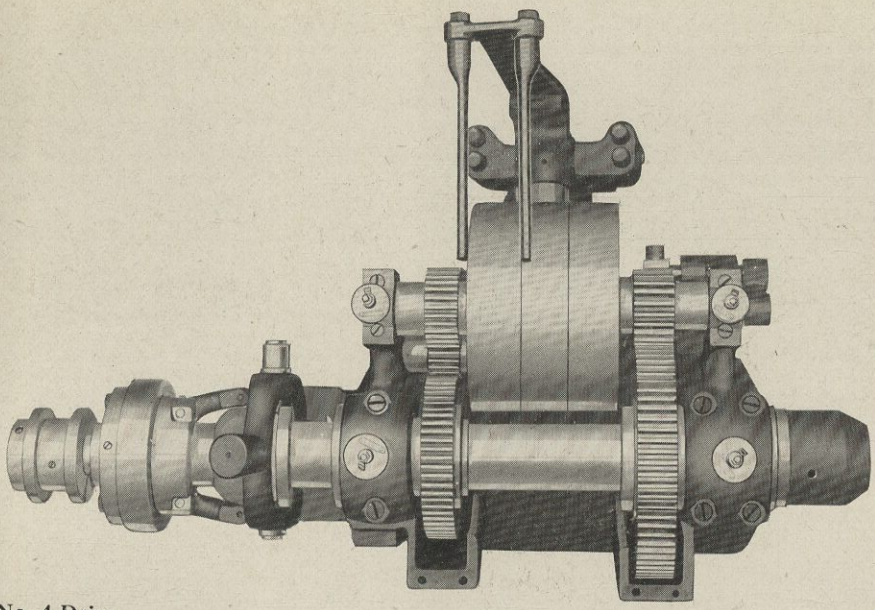
No. 1 Drive

Two Belts.
Two speeds, either one or both can be forward or reverse.



No. 2 Drive

One Belt.
Two speeds, both forward.

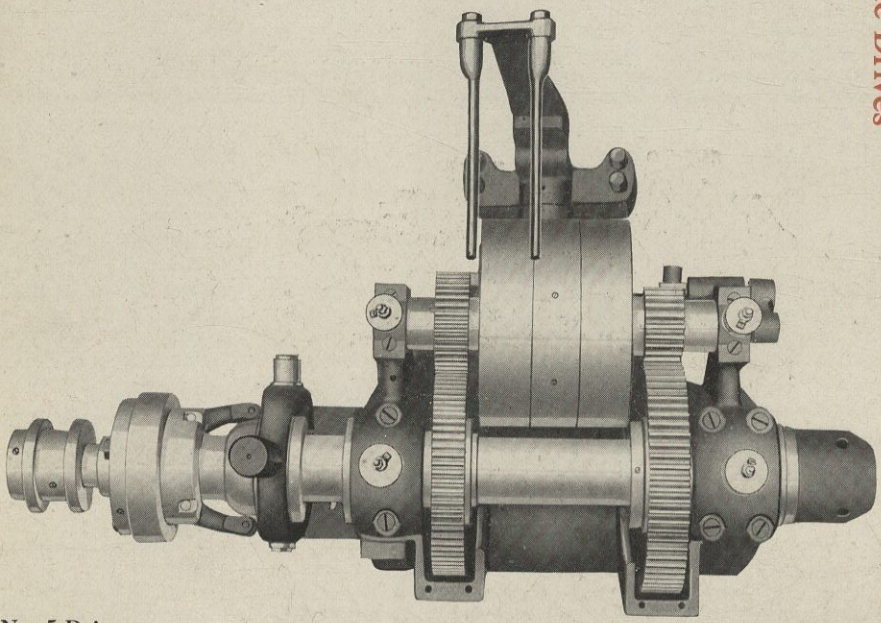


No. 4 Drive

One Belt.

Three speeds, one reverse, two forward.

This requires the 3rd speed attachment, which is constructed inside the driving pulleys.

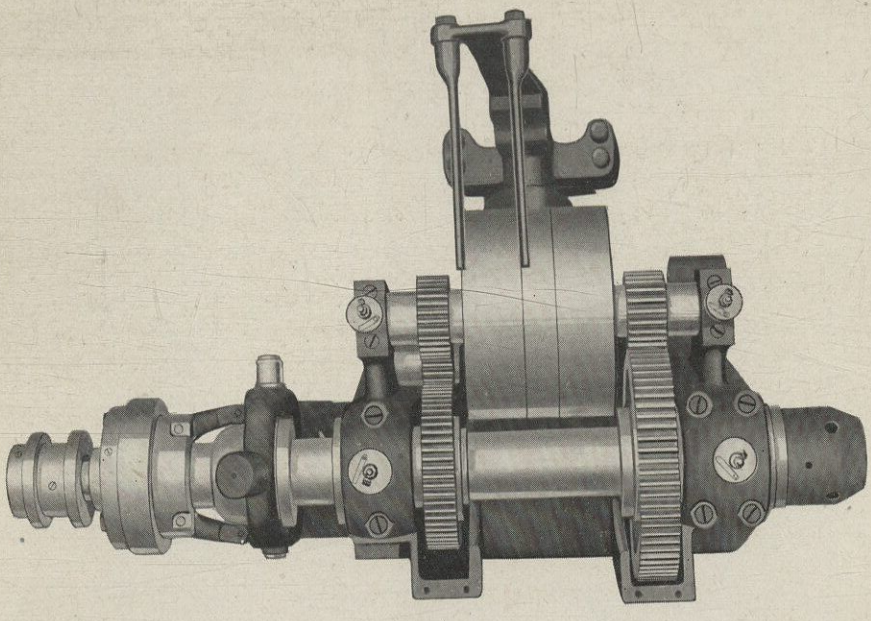


No. 5 Drive

One Belt.

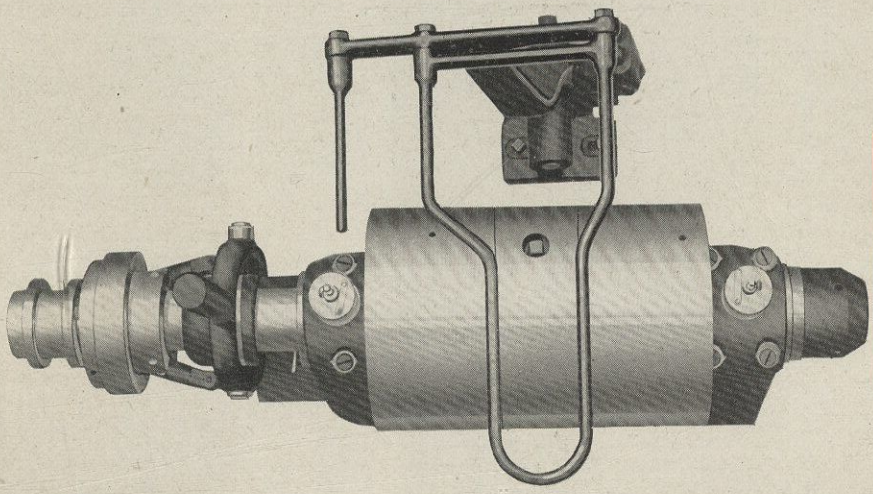
Three forward speeds.

This requires the 3rd speed attachment, which is constructed inside the driving pulleys.



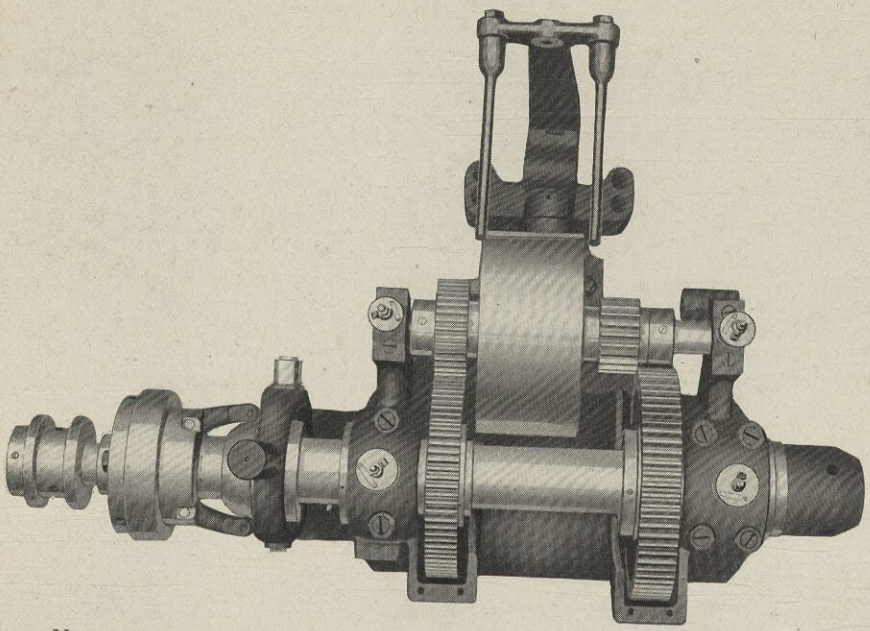
No. 8 Drive

One Belt.
Two speeds, one forward and one reverse.



No. 9 Drive

Two Belts.
Two speeds, one forward and one reverse.
This is a direct drive high speed head.



No. 10 Drive

One Belt.
Two speeds, forward; hand-operated sliding gear.
Fast speed with rear gears engaged.
Slow speed with front gears engaged.

Spindle Drives

We would call your attention to our various spindle drives with the object of impressing upon you that the drives on machines of various kinds are very satisfactory, and not very difficult to change from one design to another.

When ordering machines it is well to consider at that time the kind of drive necessary. The customer should determine the style of drive to suit the class of work to be done. In the absence of information we generally supply the universal drive, which is No. 1.

We would caution you to think this matter over if you are not users of our machines at this time and inform us the kind of drives you desire which are explained in this catalog. For instance, if you are doing light work on parts that are made from brass which requires exceptionally high speed, you should have No. 9.

CONTENTS

Factory Tests to Insure Accuracy

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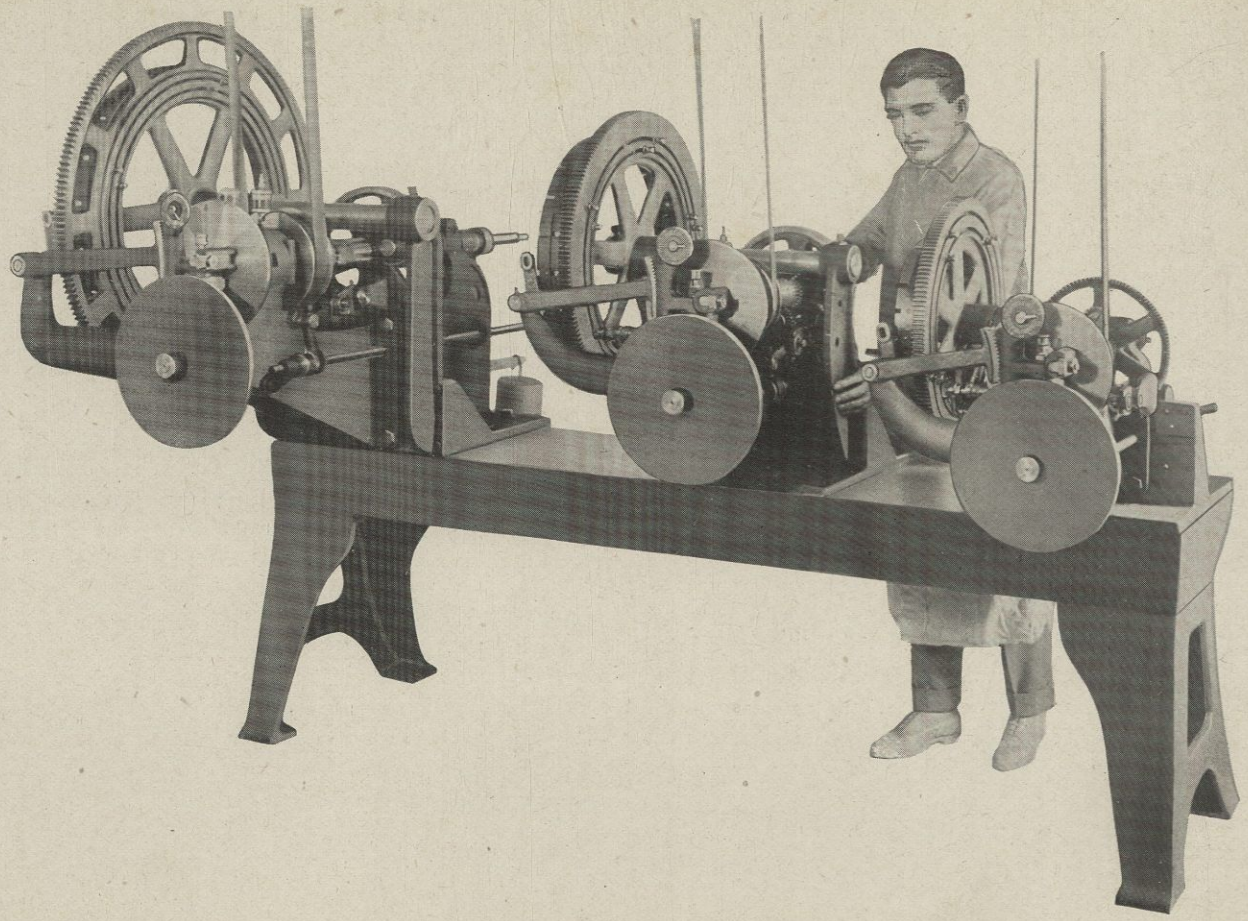
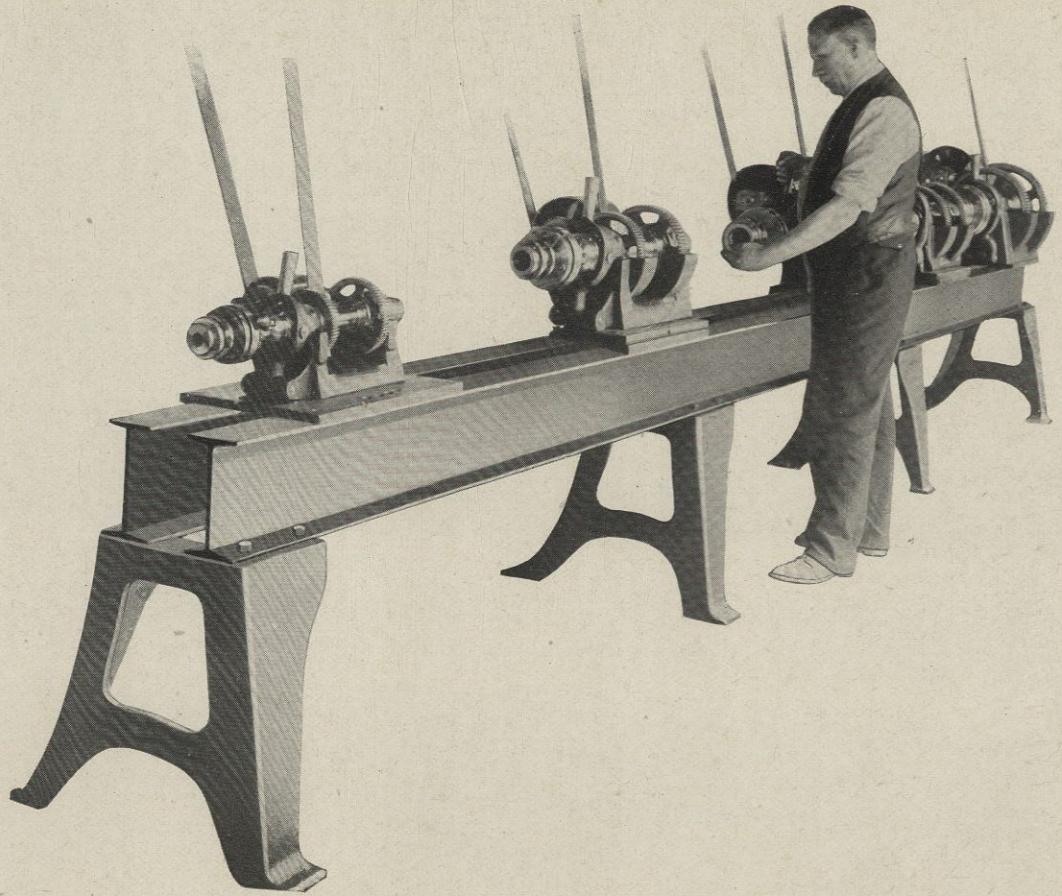


Testing
Feed
Brackets

Testing Tool Feed Mechánism

Here we show the tool feed testing mechanism of The Cleveland Automatic Machine Company. Every tool feed we manufacture is placed in position and operated to determine the accuracy of the working parts and the workmanship. Every feed is operated for a certain number of hours, tripping from high to low speed and any slight adjustments that are necessary are made before the feed bracket is fastened to the bed of the machine. The consequence is, it is rare we have any trouble whatever from this part of our machines, and if we do it is taken care of before finally being assembled in position.

Just one of the precautions necessary to enable us to be positively sure that this important piece of mechanism is always entirely satisfactory.

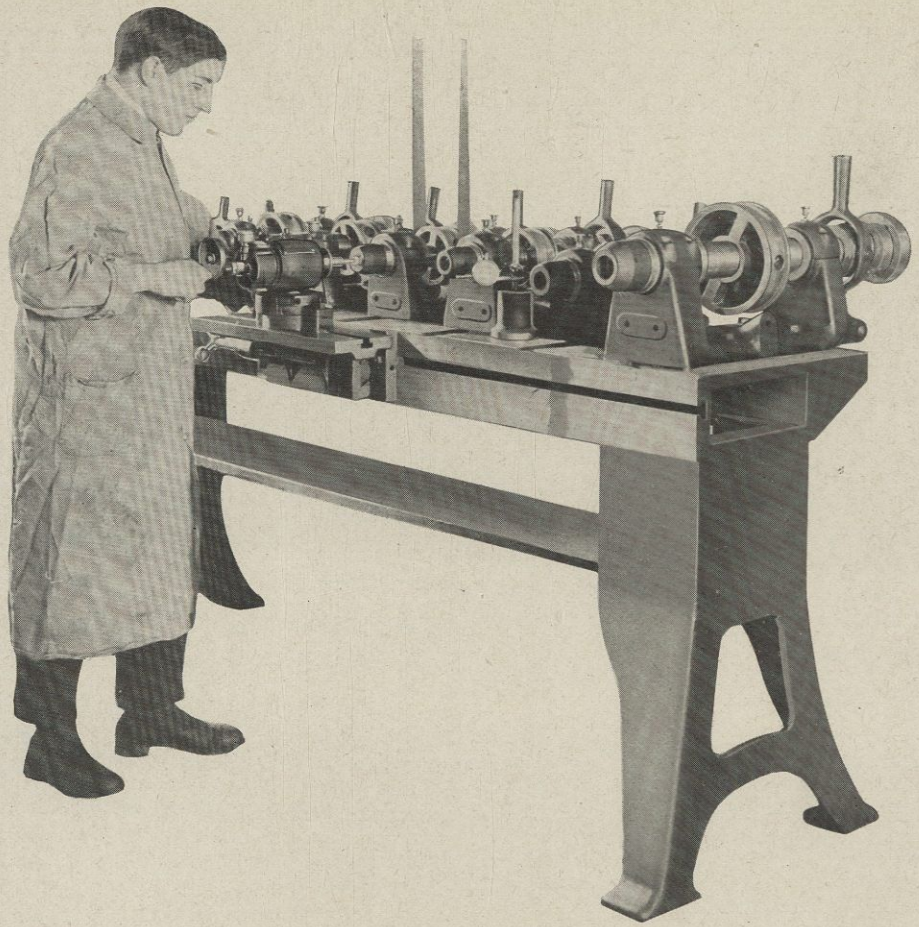


Testing Spindle
Heads

Testing Spindle Heads

We show here a number of spindle heads used in our machines.

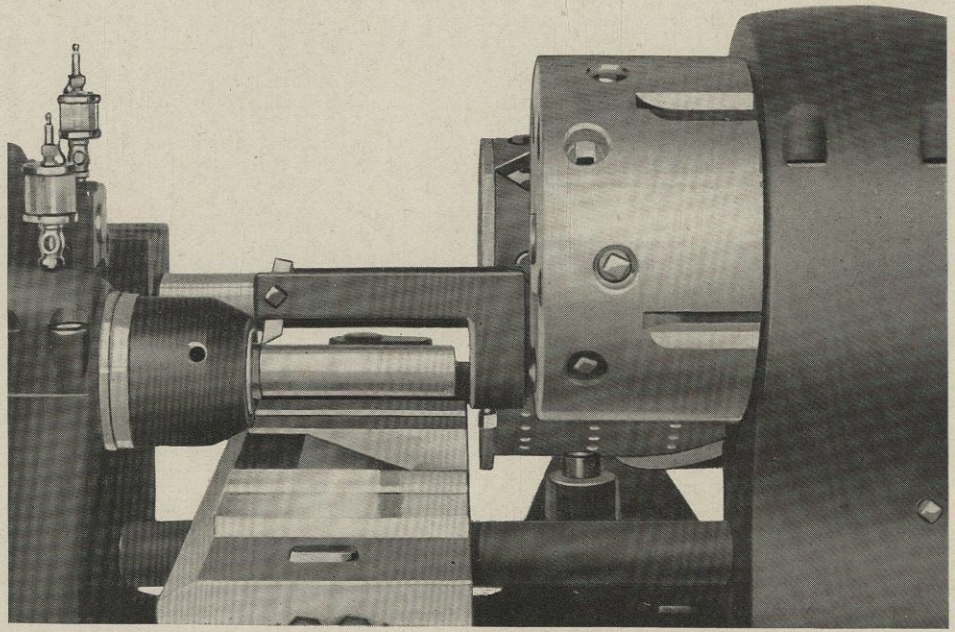
We wish to say that every spindle head we assemble is placed on these test stands and operated at high and low speeds to determine for a certainty that our gears are running absolutely true and quiet, also to be positively sure that the mechanism is accurate in every respect, and if anything is wrong we remedy it before the head is finally placed in position on the bed of the machine. The base of this head is scraped to surface plates and is accurate in every respect in relation to the spindle after it is clamped in position. We can then guarantee that it is a very satisfactory working piece of mechanism.



Grinding Chucks

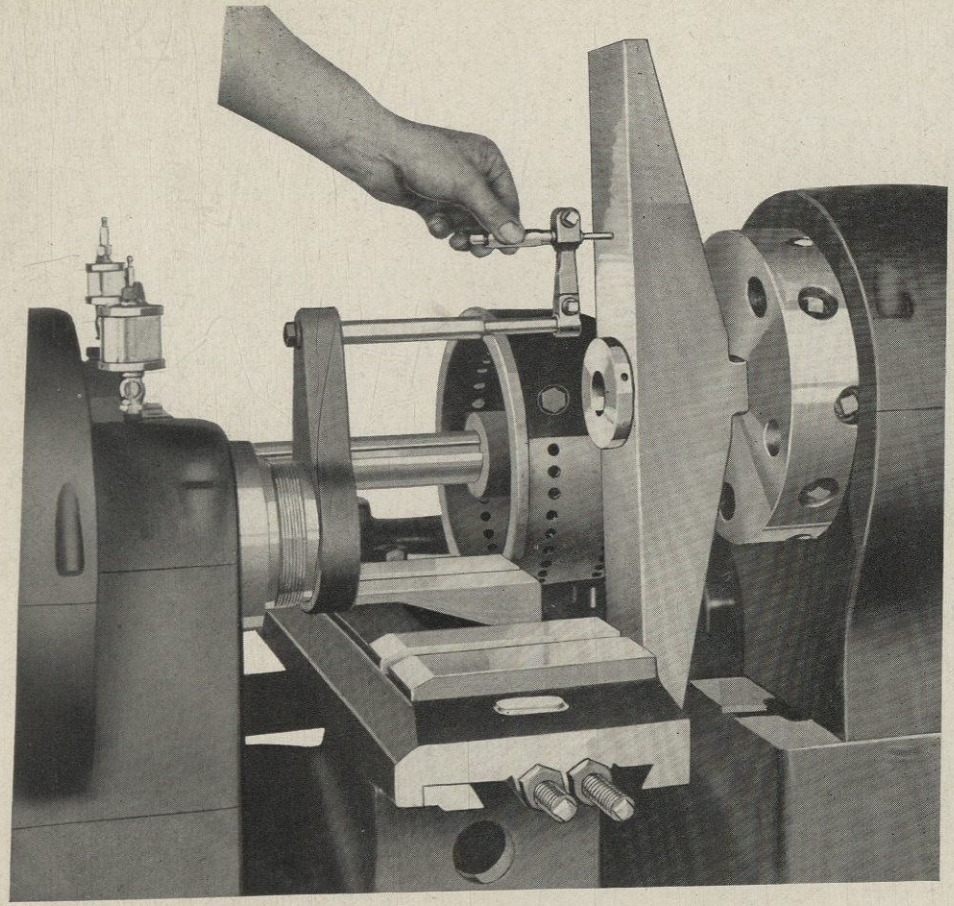
Grinding Chucks

The man we show on this cut is grinding the spring chucks for our machines. This row of spindle heads are absolutely accurate and kept that way. To produce concentric spring collets, we place them in position and grind them, having the necessary grinding apparatus that gives us the correct speed for the smallest size emery stick or wheel. This means very accurate chucks, which is very essential on most work in these days. It is just one of the things we are very particular about and the object of showing the operation is to get into your mind that this important point is not overlooked. You may build a very satisfactory spindle head and be extremely cautious to grind the hoods perfectly true, but if the spring chucks are not a good job, you will be dissatisfied, and justly so.



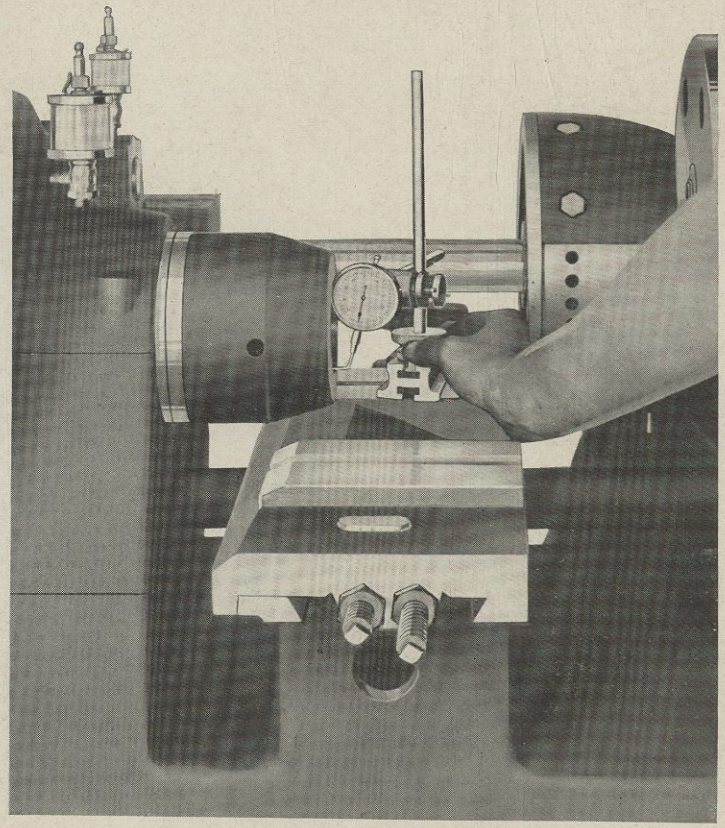
Turning Cut Test

Here we show the final test and this test is applied to all the machines we manufacture. We show an overhanging turning tool with the very smallest amount of contact to remove a very light cut from a bar extending out into tool space from the chuck hood of our machine. If this were a 2-inch machine, the bar would be about 2 inches in diameter, and the reason is to be sure there is no springing away from the cutting tool. We take very light cuts from the top of this bar and measure to determine whether it is parallel. We then take a cut on the side. After the tests are made both ways and this cut is parallel, we are positively sure of excellent alignment and this is one of the i m p o r t a n t things that the CLEVELAND never fails to be careful about. We expect our machines to produce a part absolutely parallel, and this kind of a test will determine, without question, the slightest inaccuracies.



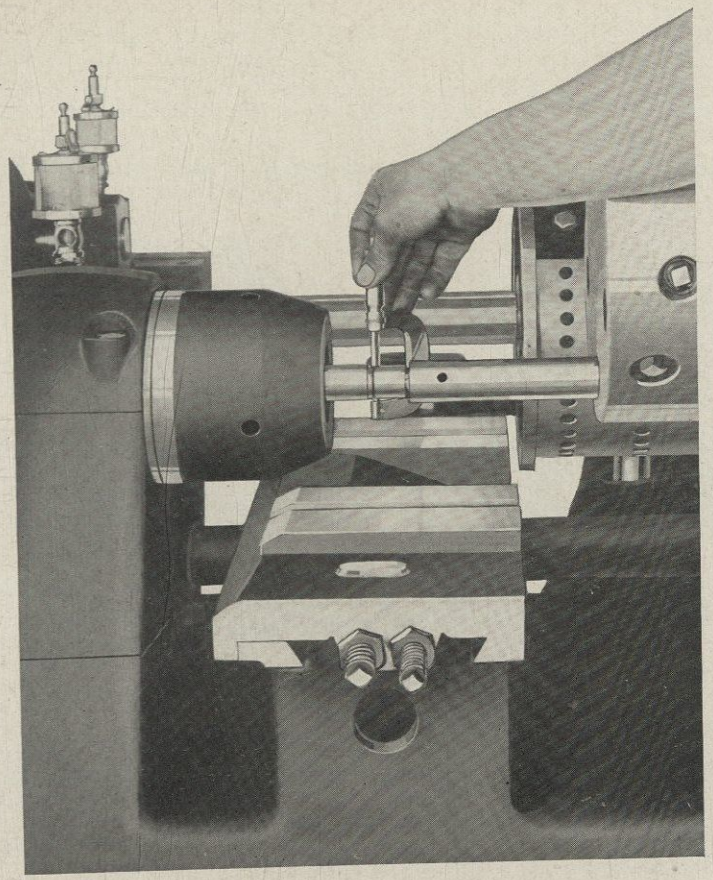
Testing Alignment of Spindle and Turret

In this test we attach an arm carrying a micrometer to the spindle of the machine. The face plate attached to the turret is parallel on the face and boss which is in contact with the turret. We take three readings, one as shown, one at the back and one at the front of machine, by turning both spindle and turret, measuring each time at the same end of the face plate.



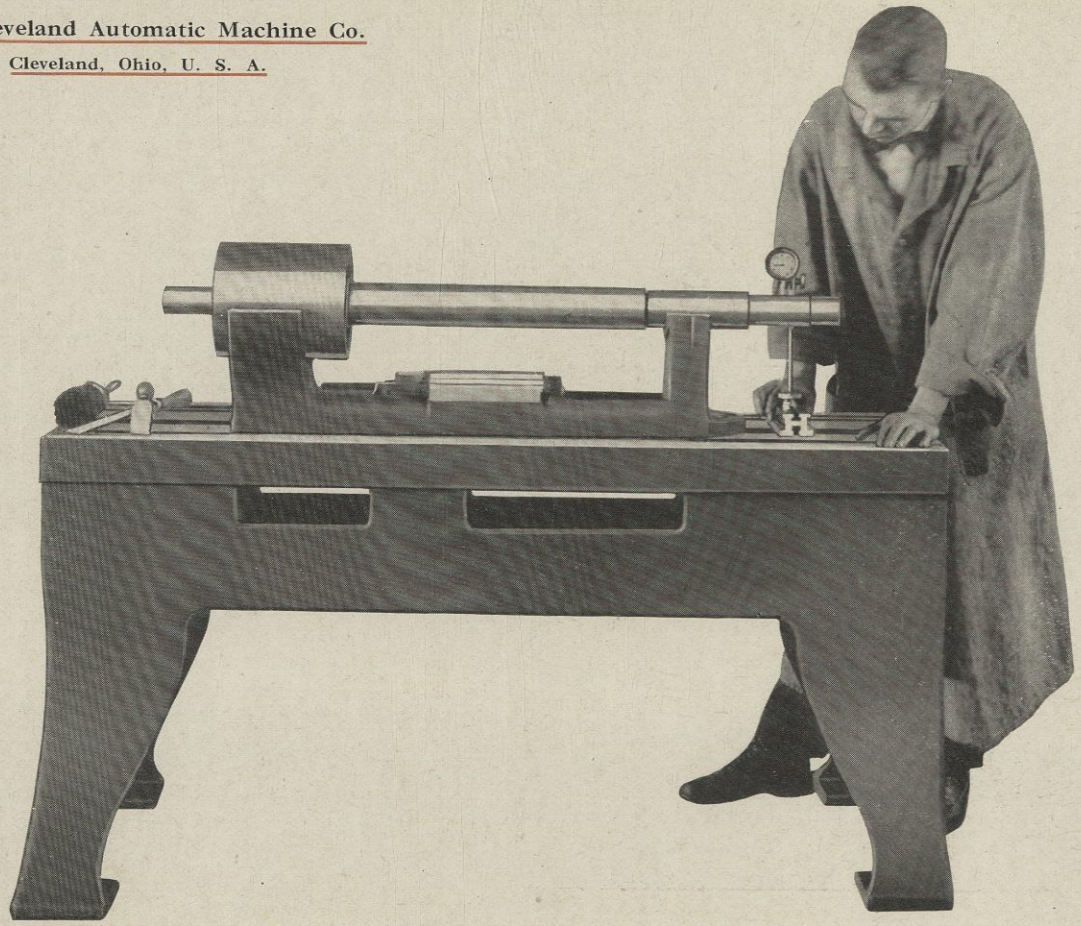
Testing Concentricity

In all cases the hoods of our machines are ground on the inside of their own spindles; the taper in the hood is ground to a gauge to obtain the exact angle and after the grinding is complete we remove the hood from the spindle several times, locking it in position each time to ascertain whether it disturbs it in any way before making the test with the instrument shown. These hoods are absolutely true, and we never ship a machine without making these tests to insure correct concentricity.



Testing Alignment of Turret Holes

Here is a case where we are extremely cautious to obtain exact alignment. We bore the turret holes from the spindle of the machine and in boring these holes we take very light cuts with a good stiff tool and bring them right up to the exact gauge size. To be sure of this accuracy we make tests, and when the machine is ready for tooling we guarantee the alignment of our automatics.

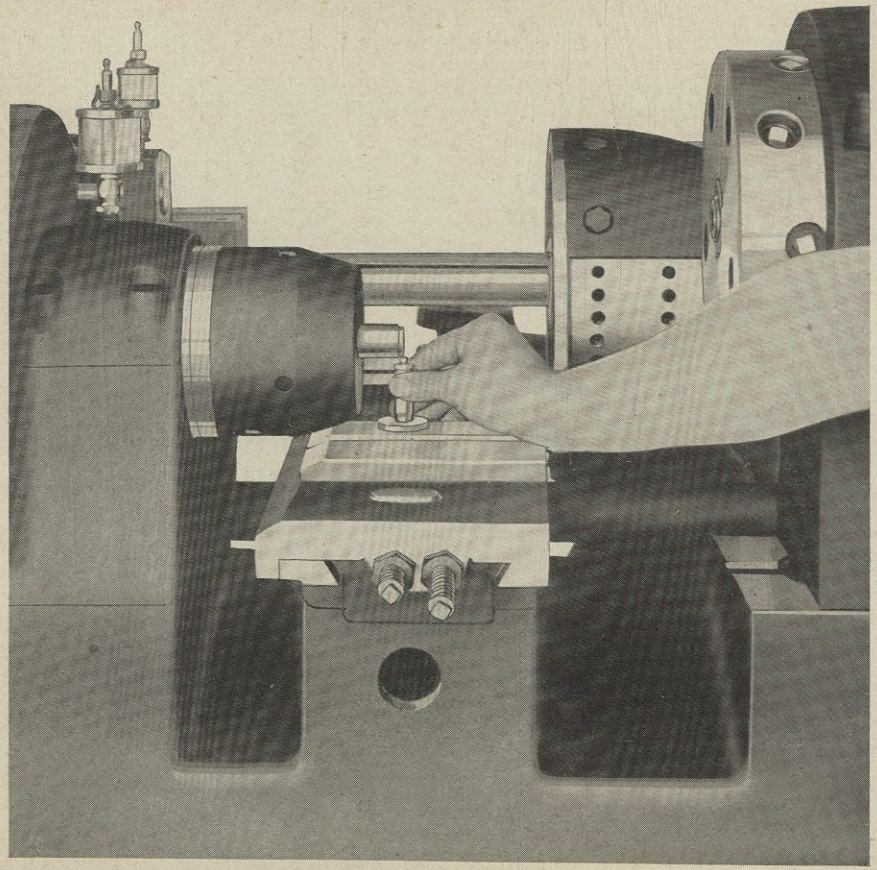


Alignment of Turret Head on Surface Plate

Accurate Testing

The reason we show this cut is to impress upon you how cautious we are in interchangeability. We show here the turret head of our machine resting on the top of an absolutely true surface. The main bearings are scraped to a ground arbor, all exactly one size. The base is then scraped to a bearing, the exact height at both ends. Notice the workman using the instrument testing the height from both ends of this arbor.

The tests are made on the side of the arbor, the gauge fits into the slot on the top of surface plate, and from this slot the gauge must read exactly the same on both ends. When this work is complete the head is correct in height and sideways. The consequence is, the bed of our machines being scraped with surface plates, producing an accurate surface, when the head is placed in position it is in perfect alignment with the spindle head, which is scraped in the same manner as the turret head. This method insures accuracy.



Testing the Height of the Cross Slide

The piece standing out of the chuck with a step at the end has been turned true with a tool on the cross slide. This step is an exact diameter. We then use the gauge to be positive of the correct height of the cross slide from the center. We are just as particular that this distance be correct as we are in the alignment of our turret, because to obtain accurate work all these dimensions must be accurate.

All we are showing here in the way of tests will convince the prospective purchaser that our machines are manufactured very carefully, and all these important dimensions are correct, otherwise we could not make duplicates and could hardly expect to obtain the best results on our machines.

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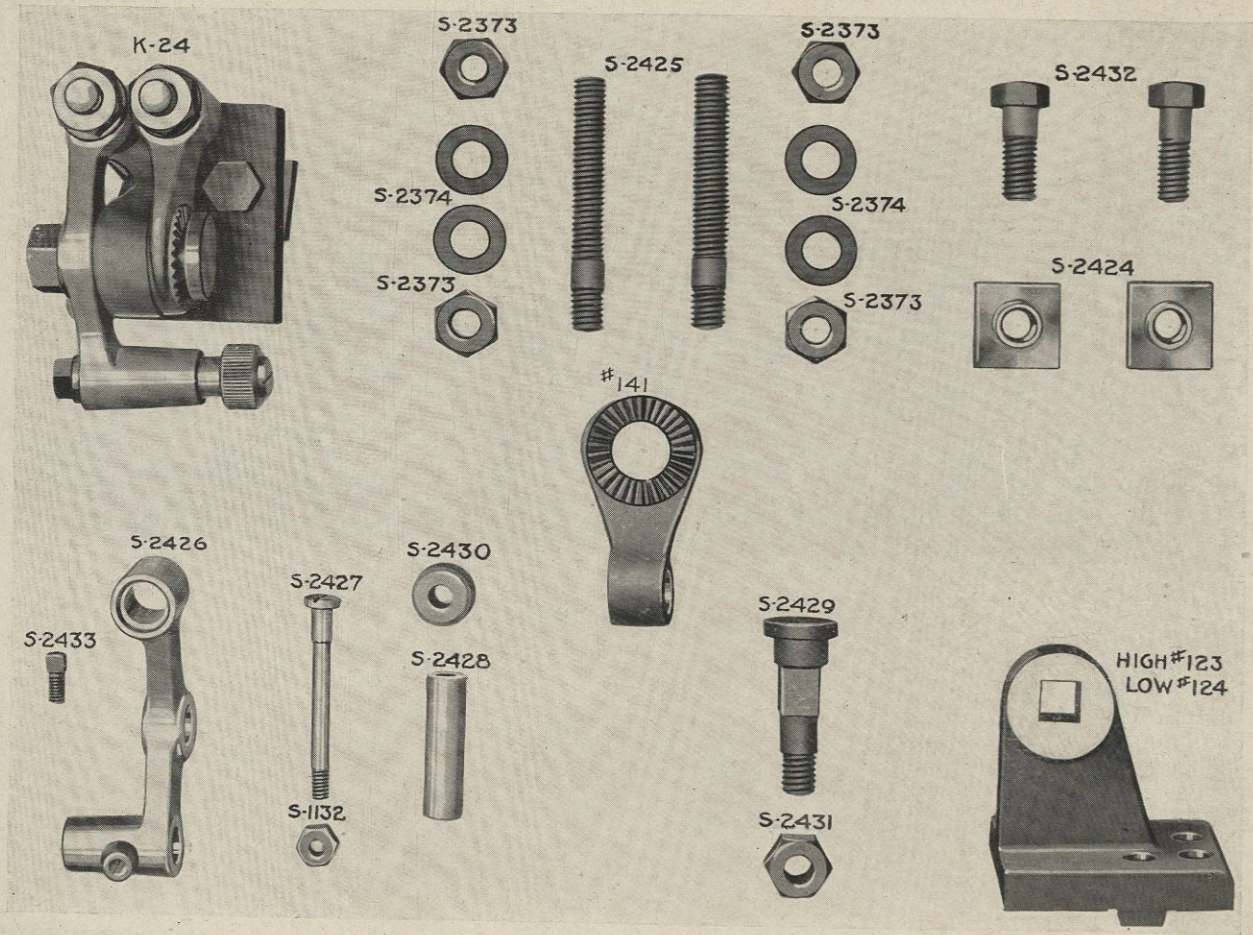
Cross Slide Tools



Cross Slide Tools

K-24—Cross Slide Knurl Holder and Post

This tool is used for knurling small short diameters close to chuck hood where a K-23 Straddle Knurl Holder cannot be used.

Where knurling is required to be exact, give circular pitch of knurl and angle of teeth.

Specify diameter to be knurled.

Specify knurls required.

If standard, in the following way:

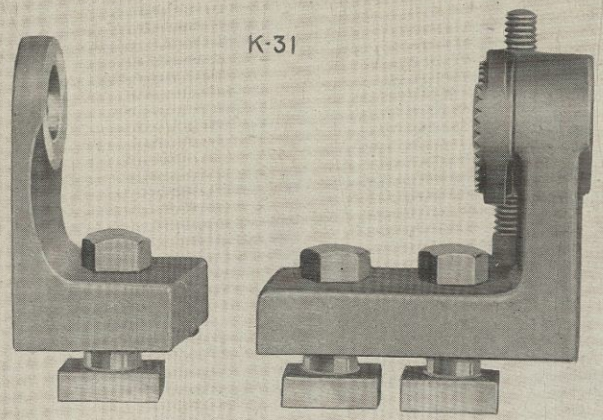
Straight knurl; whether coarse, medium or fine.

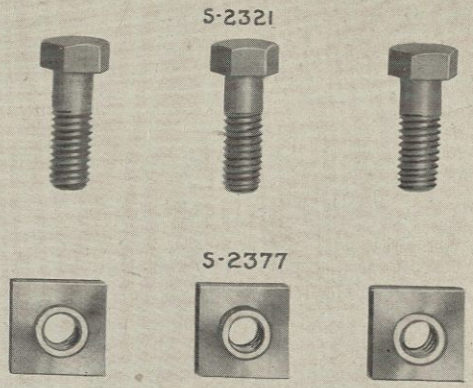
Diamond knurl; whether coarse, medium or fine.

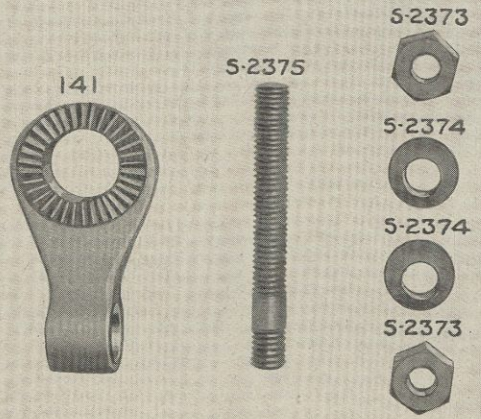
Give serial number of machine.

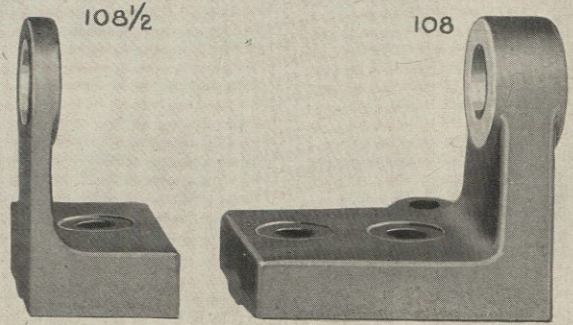
See pages 282, 283, 284 and 285 for telegraphic code.

Cross Slide Tools









Cross Slide Tools

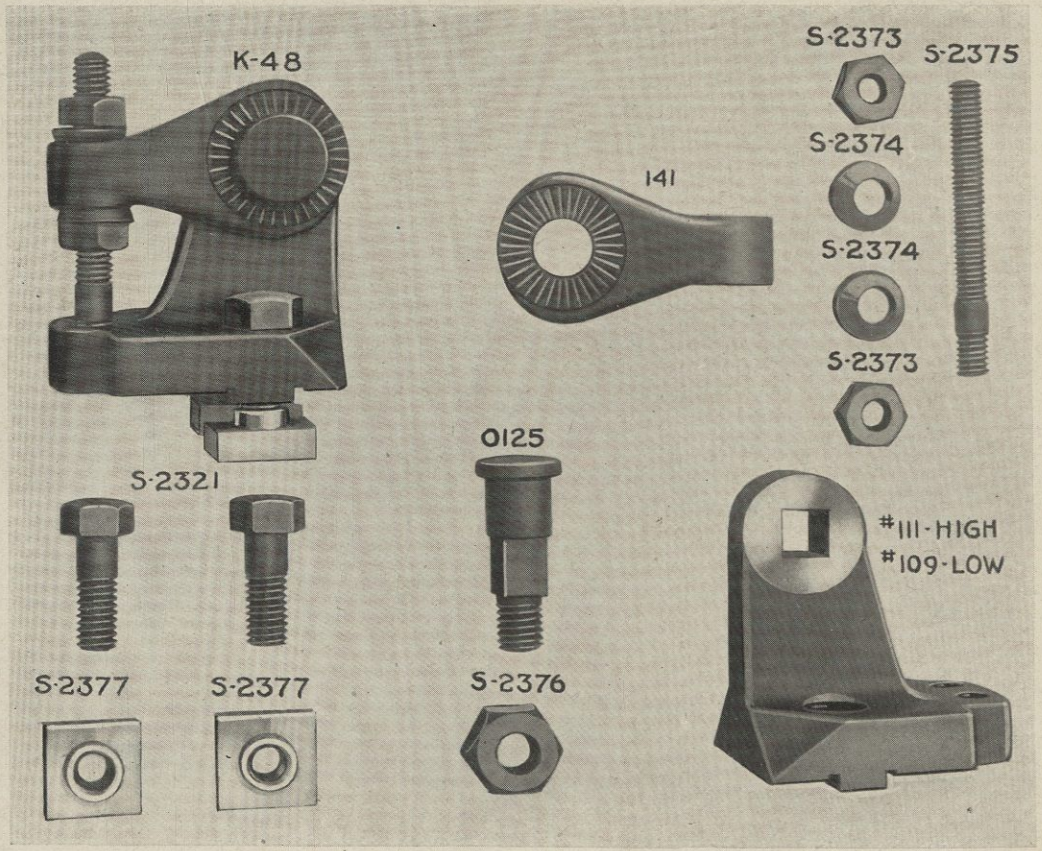
K-31—Double Ratchet Tool Post

This post is designed for wide circular forming tools requiring a support.

In ordering, give serial number of machine, width of tool, whether employed on front or rear of cross slide and the direction the spindle will run.

See pages 282, 283, 284 and 285 for telegraphic code.

Cross Slide Tools



Cross Slide Tools

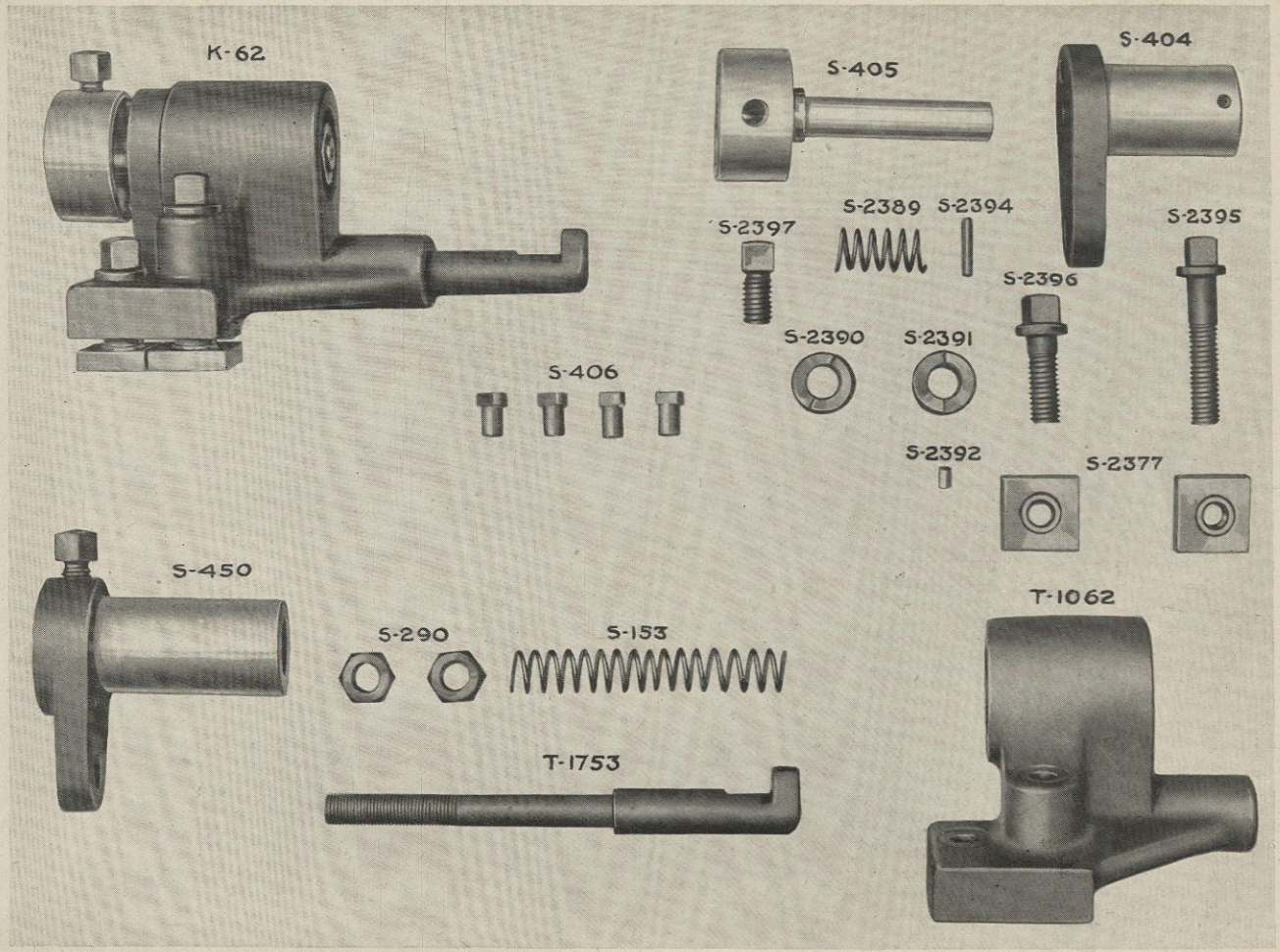
K-48—Single Ratchet Post

This post is designed for circular tools of ordinary width.

In ordering, give serial number of machine, width of tool, whether employed on front or rear of cross slide and direction the spindle will run.

See pages 282, 283, 284 and 285 for telegraphic code.

Cross Slide Tools

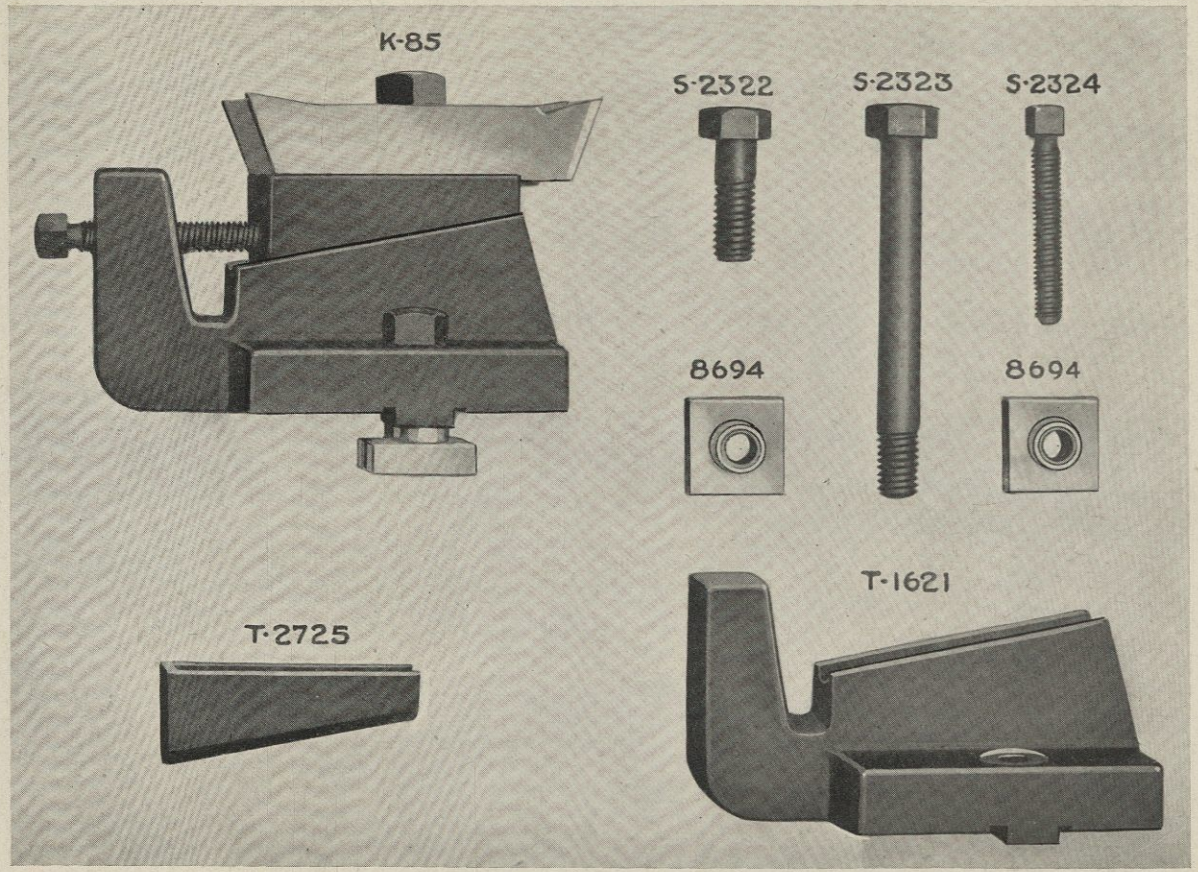


Cross Slide Tools

K-62—Cross Slide Threading or Centering Attachment

On the opposite page we show our cross slide centering and threading attachment for our Model B machine. This is fastened to the top of the front cross slide, and is shown with tap holder. It can also be used for outside threading with solid die. The tools may be changed for drilling or reaming or to carry a self-opening die. It is easy to place in position and enables you to do many jobs on our Model B machines that without the attachment would require Model A machines.

Cross Slide Tools



Cross Slide Tools

K-85—Flat Forming Tool Post

Flat forming tools are recommended for deep heavy cuts.

When ordering, specify the following:

Width of tool.

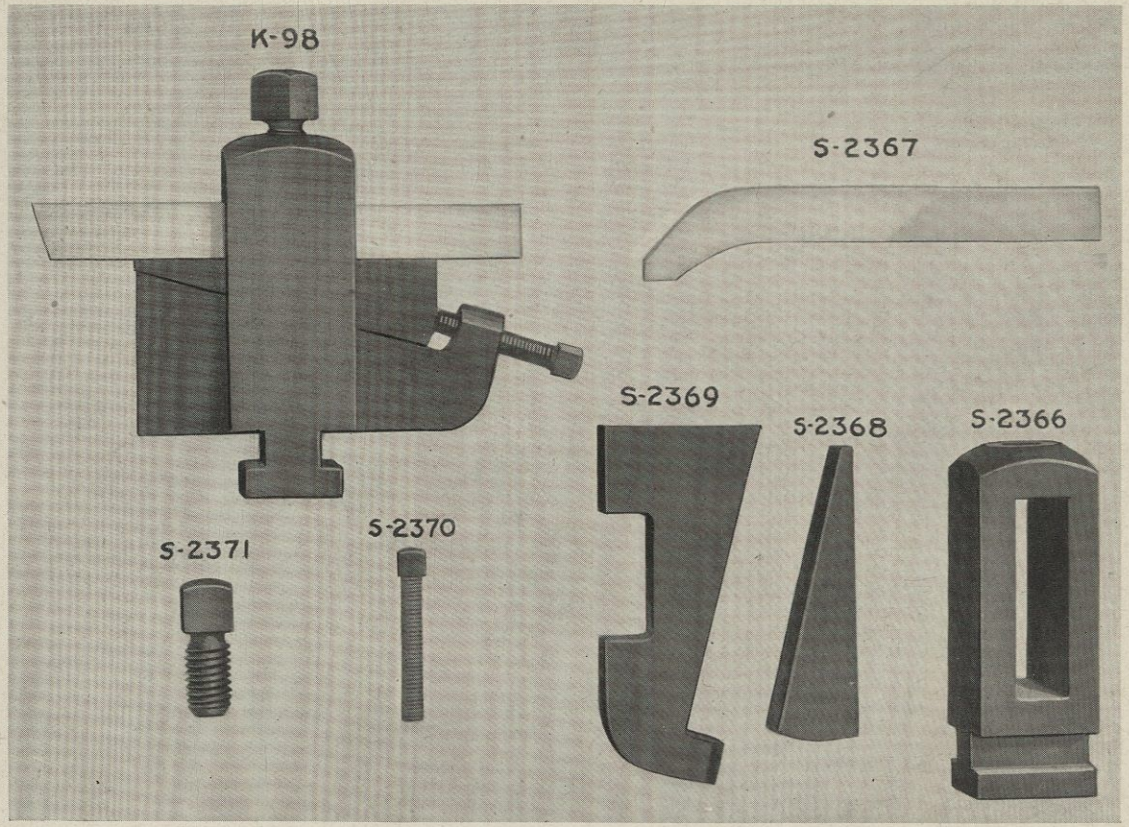
The direction the spindle will run.

Whether post is for front or rear cross slide.

Give serial number of machine.

See pages 282, 283, 284 and 285 for telegraphic code.

Cross Slide Tools



Cross Slide Tools

K-98—Square Tool Post and Cutter for Facing

Intended for light facing cuts only.

Carries a tool similar to an ordinary lathe tool.

When ordering, specify the following:

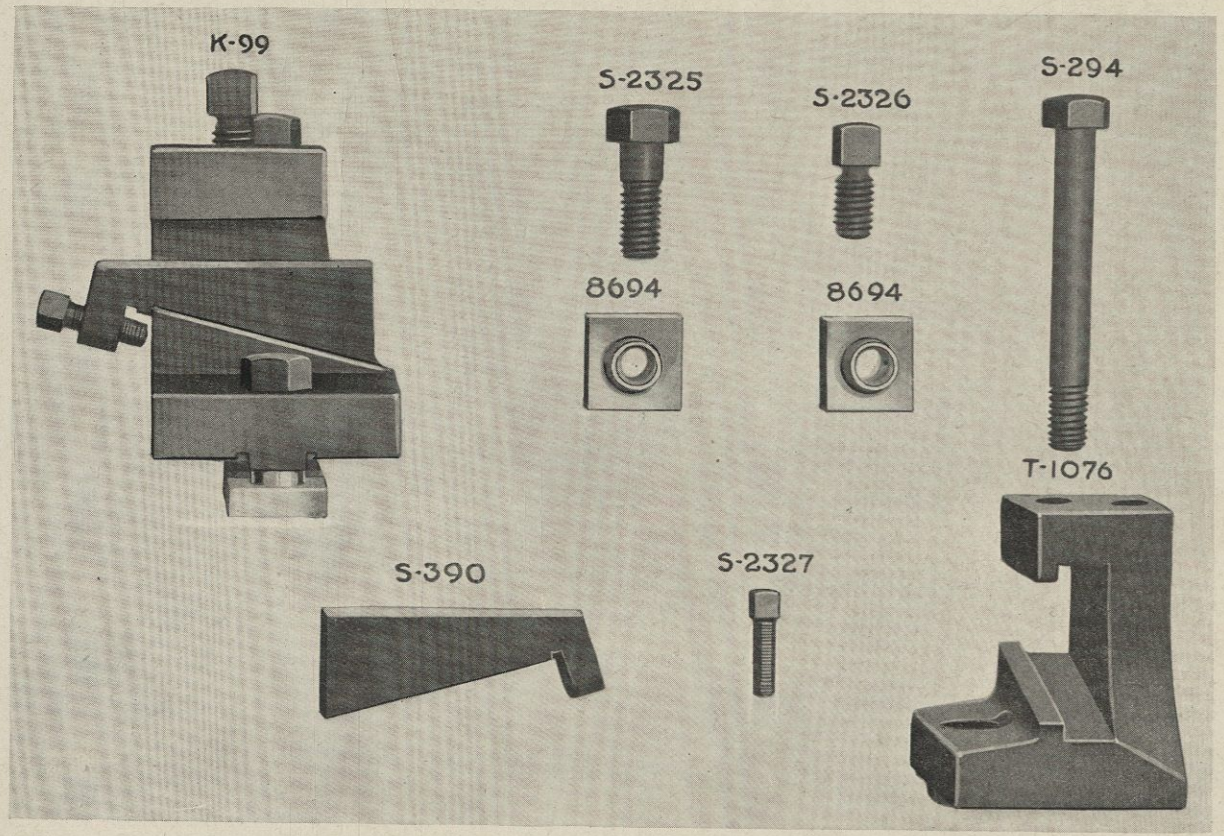
Front or rear of cross slide.

The direction the spindle will run.

Give serial number of machine.

See pages 282, 283, 284 and 285 for telegraphic code.

Cross Slide Tools



Cross Slide Tools

K-99—Openside Forming Tool Post for Light Forming Tools with Square Shanks

The post "T-1076" is fastened to the cross slide by the bolt "S-2325" and "S-294."

The forming tool is held in place by the set screw "S-2326" and is adjusted to the proper height from the cross slide by the wedge "S-390." One of the good points about this post is that a forming tool from any size stock less than its capacity can be made up quickly when you may only require a small number of the parts, thereby reducing the tool cost.

When ordering, specify the following:

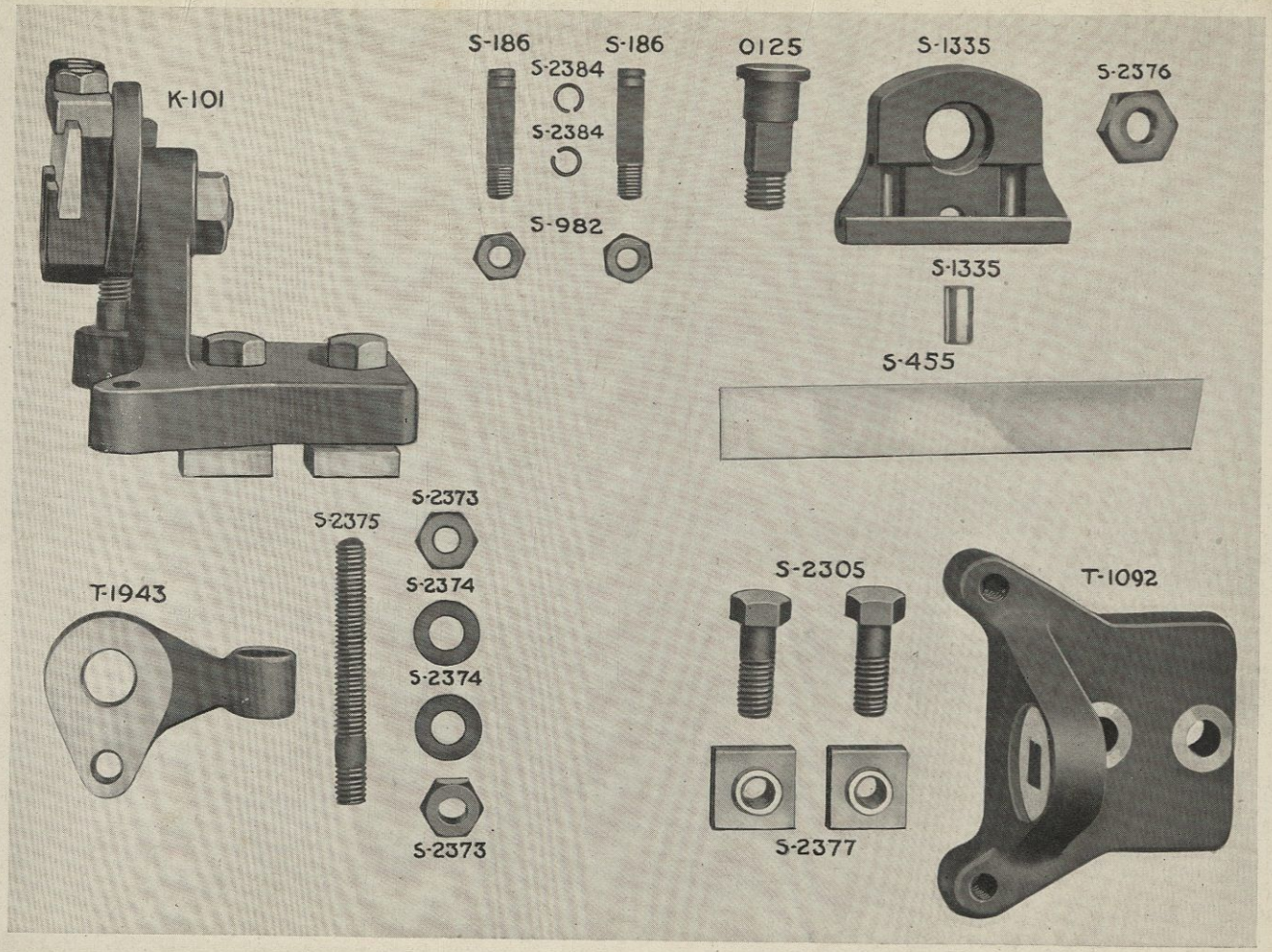
Front or rear of cross slide.

The direction the spindle will run.

Give serial number of machine.

See pages 282, 283, 284 and 285 for telegraphic code.

Cross Slide Tools



Cross Slide Tools

K-101—Universal Cut-off Tool Holder with Blade and Post

This type of cut-off tool is superior to a circular tool, owing to the side clearance.

The post is so arranged that it may be clamped to either the front or rear of cross slide.

The swinging tool holder is pivoted on the bolt which also clamps the holder, ratchet and post together.

Threaded stud supports the ratchet, also gives the adjustment to tool holder.

The flat cut-off blade is clamped in place by the two bolts.

This may be used in four different positions:

1st.—On rear of cross slide, cutting edge down, for spindle running forward.

2nd.—On rear of cross slide. Reverse the tool holder and blade, cutting edge up, for spindle reversed.

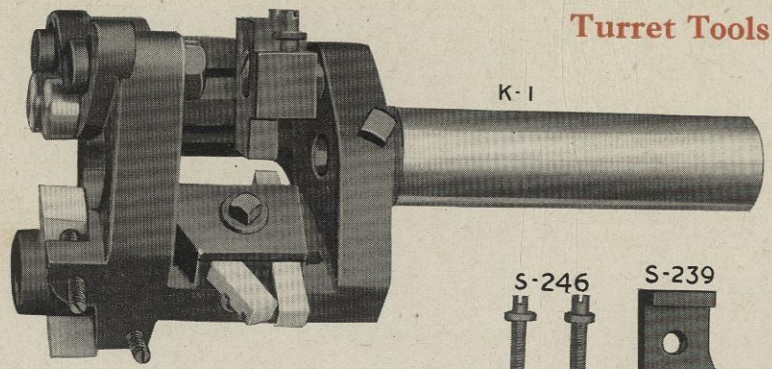
3rd.—For front of cross slide. Reverse position of ratchet and threaded stud, leaving tool holder in same position described in 2nd and reverse the blade, cutting edge up, for spindle running forward.

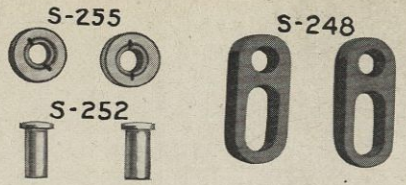
4th.—Reverse the tool holder and blade, cutting edge down, for spindle reversed.

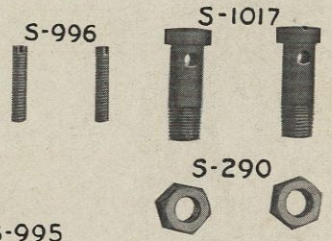
Give serial number of machine.

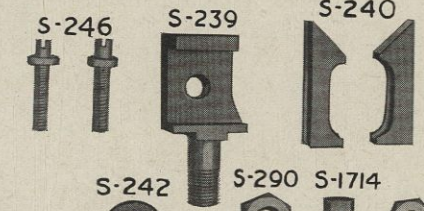
See pages 282, 283, 284 and 285 for telegraphic code.

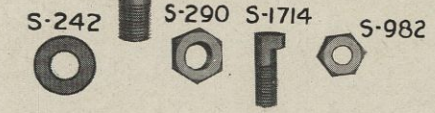
Turret Tools

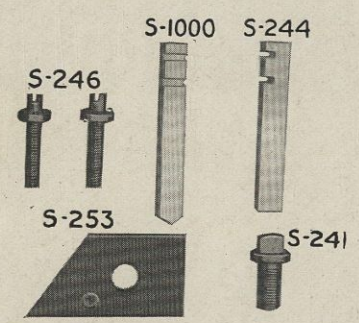


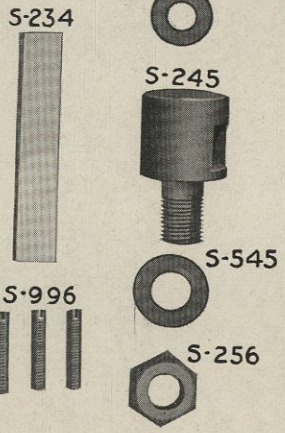


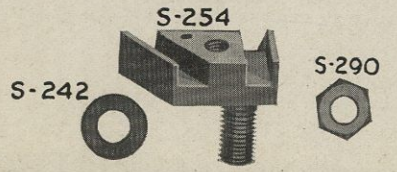


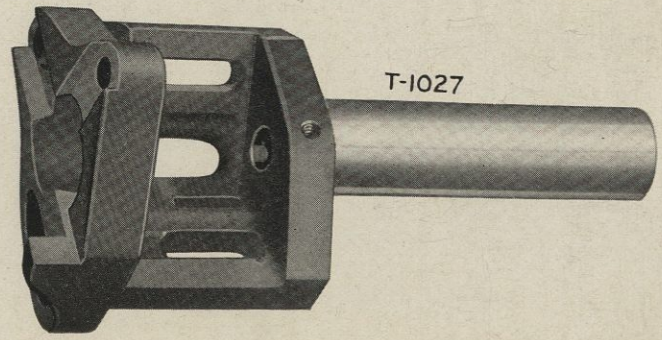


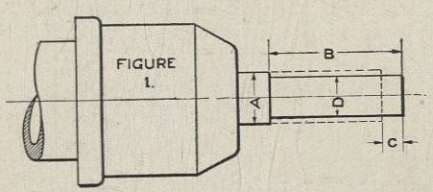






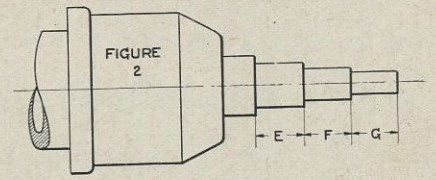






Turret Tools

K-1—Box Mill



This is a roughing mill, but where very close accuracy is not required, it will finish.

In ordering furnish complete range of work you wish to handle. This mill is supplied regularly for cutting right hand.

The body, T-1027, varies in length and we can furnish standard mills for milling following lengths:

For the	3/8"	Model A and G Machines	2 1/4" only
" "	5/8"	" A and G "	2 5/8" and 3 3/4"
" "	7/8"	" A "	3 3/4" and 4 3/4"
" "	7/8"	" C "	3 3/4", 4 3/4" and 6 3/4"
" "	1 1/4" and 2"	Model A "	4", 5" and 6"
" "	1 1/4" and 2"	Model C "	4", 5", 6" and 8"
" "	2 1/4"	Model A "	5", 6" and 7"
" "	2 3/4"	" A "	6", 7" and 8"

When the stock is fed full length and you wish to mill close to the chuck hood, it would require the longest body we manufacture. (See Fig. 1 at B.)

If you fed the stock full length and wanted to mill a short cut shown at "C" with same mill, it would be impossible, as you could not move the mill longitudinally far enough away to produce this short cut. Therefore you would need a shorter body mill.

In ordering a mill for such work as is shown in Fig. 2, the shoulders designated as E, F and G vary in length, and the adjustment of cutters would have to be considered. Send us sketches in such cases.

The smallest diameters we can reduce with this mill are as follows:

For the	3/8" and 5/8"	Model A and G Machines		3/16"
" "	7/8"	Model A and C	"	1/4"
" "	1 1/4" and 2"	Model A and C	"	3/8"
" "	2 1/4"	Model A	"	1/2"
" "	2 3/4"	" A	"	9/16"

The largest diameters that will enter this mill for our various sizes and models of machines follow:

For the	3/8"	Model A and G Machines		1/2"
" "	5/8"	" A and G	"	3/4"
" "	7/8"	" A and C	"	1"
" "	1 1/4" and 2"	Model A and C Machines		1 3/8"
" "	2 1/4"	Model A	"	1 3/4"
" "	2 3/4"	" A	"	2 1/16"

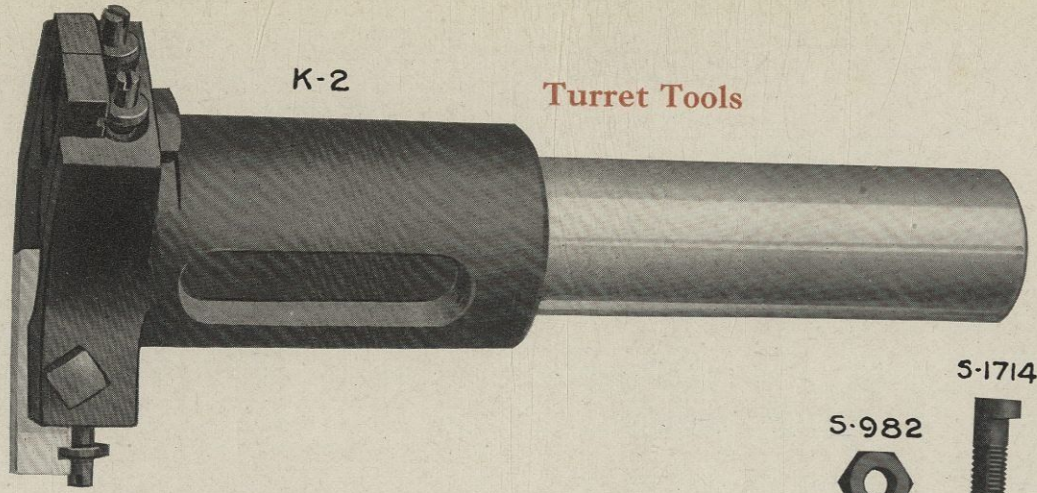
The mills for our 2 3/4" machines and up are very heavy and in most cases we advise the use of the K-42 Overhanging Turret Turning Attachment. (See page 236.)

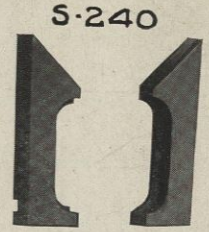
The above information means when ordering this mill we require the following data:

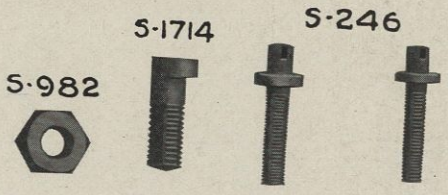
Diameter of stock to be milled, shown on Fig. 1 at A.
Length of milling cut shown at B or C.
Finished diameter shown at D.
Give serial number of machine on which you wish to use the mill.

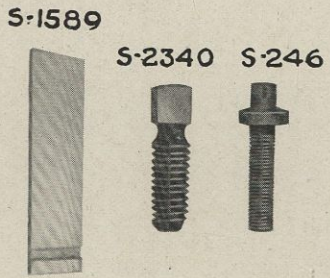
See pages 282, 283, 284 and 285 for telegraphic code.

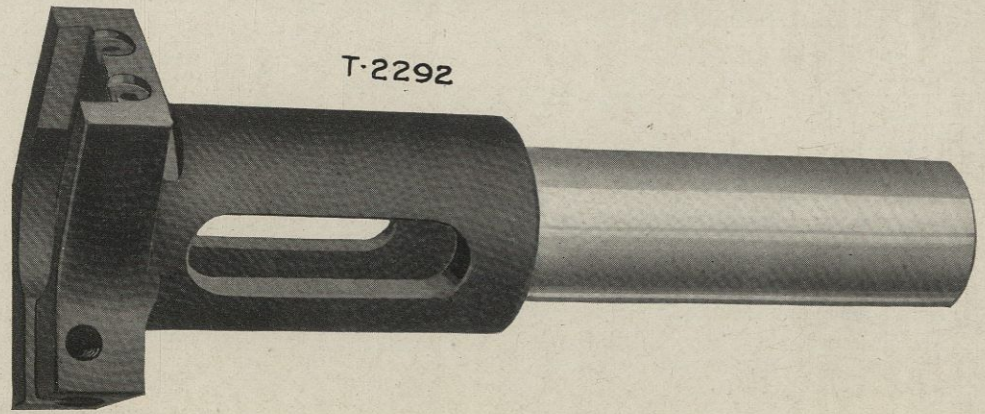
Turret Tools





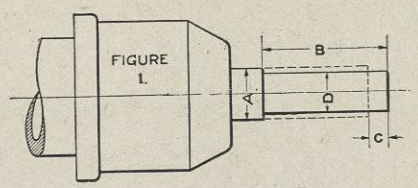






Turret Tools

K-2—Box Mill



This is a shaving mill used to finish diameters requiring extreme accuracy.

In ordering kindly furnish the following information:

The body, T-2292, varies in length and we can furnish standard mills for milling following lengths on our various sizes and models of machines:

For the 3/8" Model A and G Machines	2 1/4" only
" " 5/8" " A and G "	2 5/8" and 3 3/4"
" " 7/8" " A "	3 3/4" and 4 3/4"
" " 7/8" " C "	3 3/4", 4 3/4" and 6 3/4"
" " 1 1/4" and 2" Model A "	4", 5" and 6"
" " 1 1/4" and 2" Model C "	4", 5", 6" and 8"
" " 2 1/4" Model A "	5", 6" and 7"
" " 2 3/4" " A "	6", 7" and 8"

This is a single cutter mill and can be used for milling one shoulder only. This mill is supplied regularly for cutting right hand.

When the stock is fed full length and you wish to mill close to the chuck hood, it would require the longest body we manufacture. (See Fig. 1 at B.)

If you fed the stock full length and wanted to mill a short cut shown at "C" with the same mill, it would be impossible, as you could not move the mill longitudinally far enough away to produce this short cut. Therefore you would need a shorter body mill.

The smallest diameters we can shave on our various sizes and models of machines with this mill are as follows:

For the 3/8" and 5/8" Model A and G Machines	3/16"
" " 7/8" Model A and C "	1/4"
" " 1 1/4" and 2" Model A and C "	3/8"
" " 2 1/4" Model A "	1/2"
" " 2 3/4" " A "	9/16"

The largest diameters that will enter this mill for our various sizes and models of machines are as follows:

For the 3/8" Model A and G Machines	1/2"
" " 5/8" " A and G "	3/4"
" " 7/8" " A and C "	1"
" " 1 1/4" and 2" Model A and C Machines	1 3/8"
" " 2 1/4" Model A "	1 3/4"
" " 2 3/4" " A "	2 7/16"

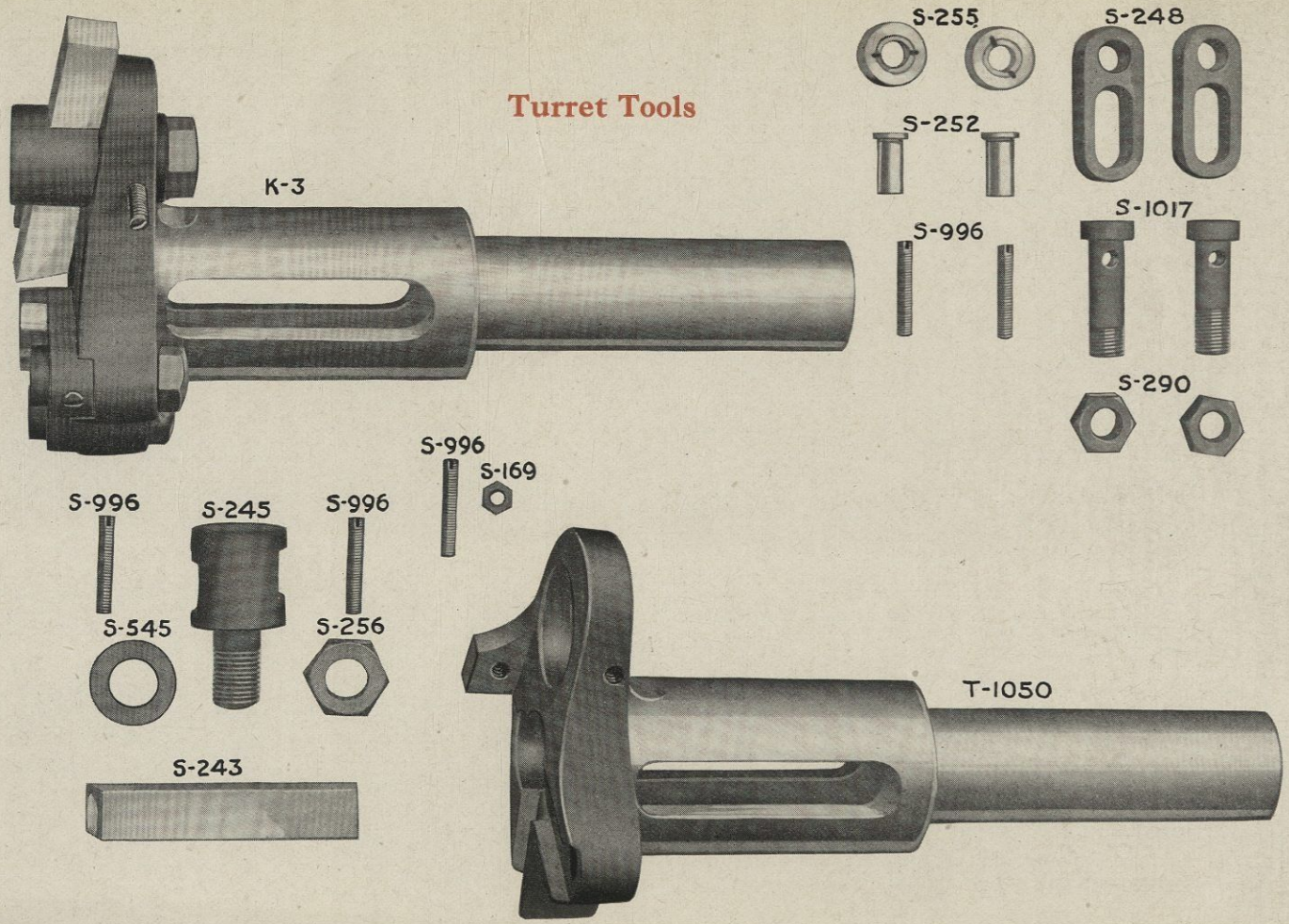
The mills for our 2 3/4" machines and up are very heavy and in most cases we advise the use of the K-42 Overhanging Turret Turning Attachment. (See page 236.)

The above information means that when ordering this mill we require the following data:

Diameter of stock to be milled, shown at A, Fig. 1.
Length of milling cut shown at B or C.
Finished diameter shown at D.
Give serial number of machine on which you wish to use the mill.

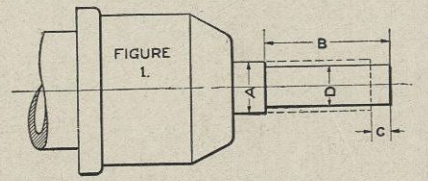
See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools



Turret Tools

K-3—Box Mill



This mill is intended for a roughing mill, but where very close accuracy is not required it will produce a finish cut.

In ordering kindly furnish the following information:

The body, T-1050, varies in length and we can furnish standard mills for milling following lengths on our various sizes and models of machines:

For the	3/8"	Model A and G Machines	2 1/4" only
" "	5/8"	" A and G "	2 5/8" and 3 3/4"
" "	7/8"	" A "	3 3/4" and 4 3/4"
" "	7/8"	" C "	3 3/4", 4 3/4" and 6 3/4"
" "	1 1/4" and 2"	Model A "	4", 5" and 6"
" "	1 1/4" and 2"	Model C "	4", 5", 6" and 8"
" "	2 1/4"	Model A "	5", 6" and 7"
" "	2 3/4"	" A "	6", 7" and 8"

This is a single cutter mill and can be used for milling one shoulder only. This mill is supplied regularly for cutting right hand.

When the stock is fed full length and you wish to mill close to the chuck hood, it will require the longest body we manufacture. (See Fig. 1 at B.)

If you fed the stock full length and wanted to mill a short cut shown at "C" with same mill, it would be impossible, as you could not move the mill longitudinally far enough away to produce this short cut. Therefore you would need a shorter body mill.

The smallest diameters we can reduce stock to follow:

For the	3/8" and 5/8"	Model A and G Machines	3/16"
" "	7/8"	Model A and C "	1/4"
" "	1 1/4" and 2"	Model A and C "	3/8"
" "	2 1/4"	Model A "	1/2"
" "	2 3/4"	" A "	9/16"

The largest diameters that will enter this mill for our various sizes and models of machines follow:

For the	3/8"	Model A and G Machines	1/2"
" "	5/8"	" A and G "	3/4"
" "	7/8"	" A and C "	1"
" "	1 1/4" and 2"	Model A and C Machines	1 3/8"
" "	2 1/4"	Model A "	1 3/4"
" "	2 3/4"	" A "	2 7/16"

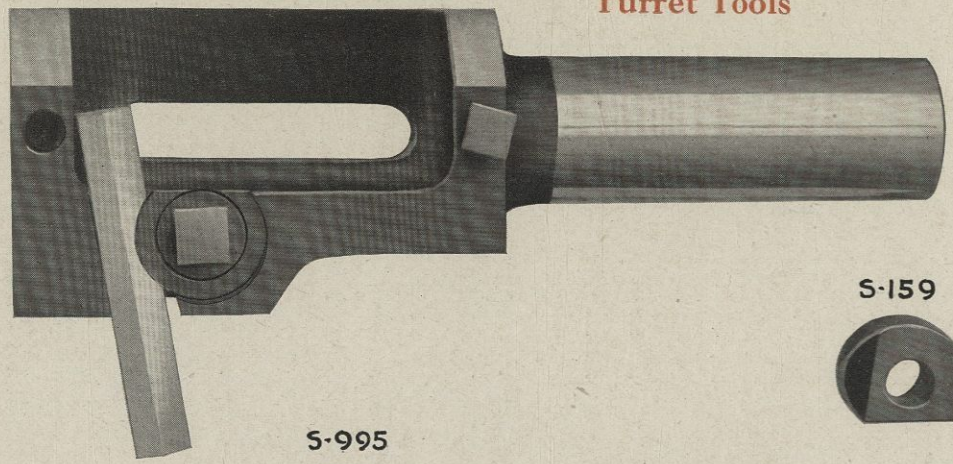
The mills for our 2 3/4" machines and up are very heavy and in most cases we advise the use of the K-42 Overhanging Turret Turning Attachment. (See page 236.)

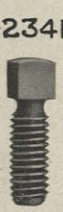
The above information means when ordering this mill we require the following data:

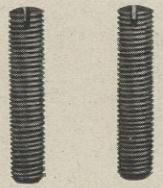
Diameter of stock to be milled, shown on Fig. 1 at A.
Length of the milling cut shown at B or C.
Finished diameter shown at D.
Give serial number of machine on which you wish to use the mill.

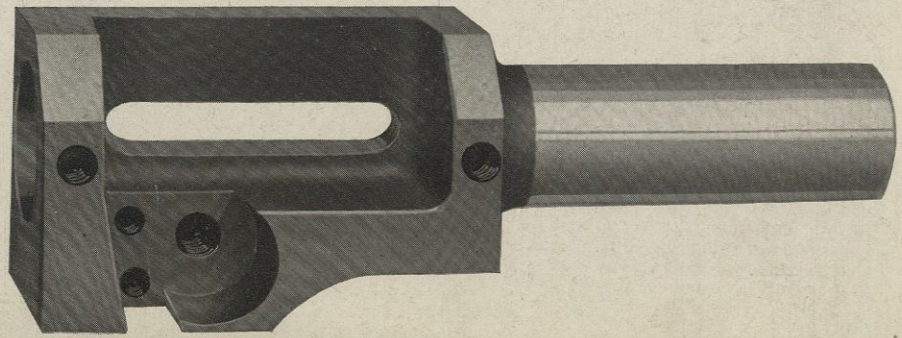
See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools









Turret Tools

K-4—Box Mill

This mill is best adapted for turning brass, and small diameters on smooth drawn steel where shoulder to be turned and stock diameter is accurate; it is also used on steel for end forming operations.

This mill is furnished with one blank bushing and is arranged regularly for cutting right hand.

The body, T-1231, varies in length. We furnish standard mills for milling following lengths:

For the 3/8" Model A and G Machines ..... 1 7/8" only
" " 5/8" " A and G " ..... 2 1/4" and 3 1/4"
" " 7/8" " A and C " ..... 2 7/8" and 3 11/16"
" " 1 1/4" and 2" Model A and C Machines ..... 4" and 5"

The largest diameters that will enter this mill for our various sizes and models of machines follow:

For the 3/8" Model A and G Machines ..... 1/2"
" " 5/8" " A and G " ..... 7/8"
" " 7/8" " A and C " ..... 1 1/8"
" " 1 1/4" and 2" Model A and C Machines ..... 1 1/2"

When ordering this mill kindly furnish following information:

Diameter of stock to be milled.

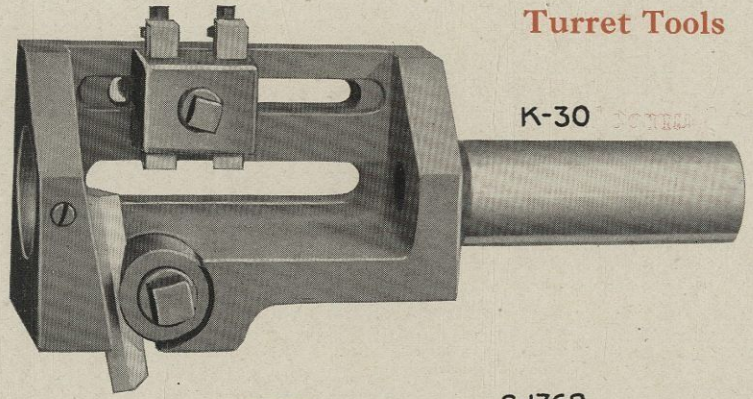
Length of milling cut.

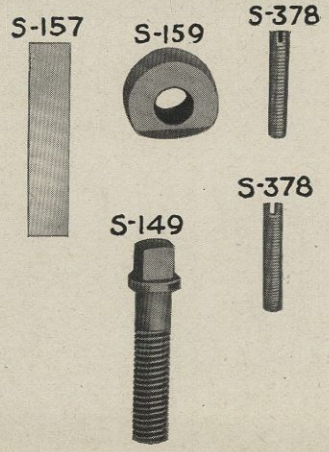
Finished diameter.

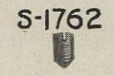
Serial number of the machine.

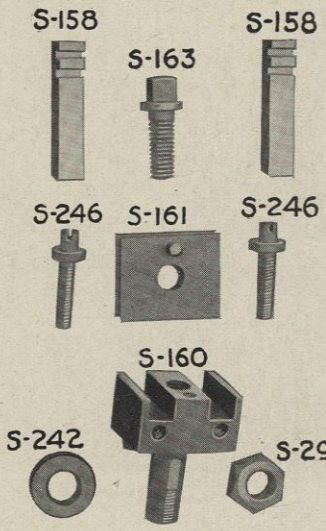
See pages 282, 283, 284 and 285 for telegraphic code.

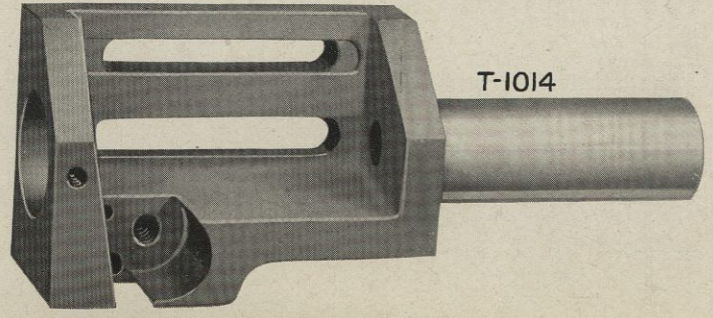
Turret Tools











Turret Tools

K-30—Box Mill

This mill is best adapted for turning brass, and small diameters on smooth drawn steel where shoulders to be turned and stock diameter are accurate.

The mill is furnished with one blank bushing and three cutters and is arranged regularly for cutting right hand.

The body, T-1014, varies in length. We furnish standard mills for milling following lengths:

For the 3/8" Model A and G Machines ..... 1 7/8" only
" " 5/8" " A and G " ..... 2 1/4" and 3 1/4"
" " 7/8" " A and C " ..... 2 7/8" and 3 11/16"
" " 1 1/4" and 2" Model A and C Machines ..... 4" and 5"

The largest diameters that will enter this mill for our various izes and models of machines follow:

For the 3/8" Model A and G Machines ..... 1/2"
" " 5/8" " A and G " ..... 7/8"
" " 7/8" " A and C " ..... 1 1/8"
" " 1 1/4" and 2" Model A and C Machines ..... 1 1/2"

When ordering this mill kindly furnish the following information:

Diameter of stock to be milled.

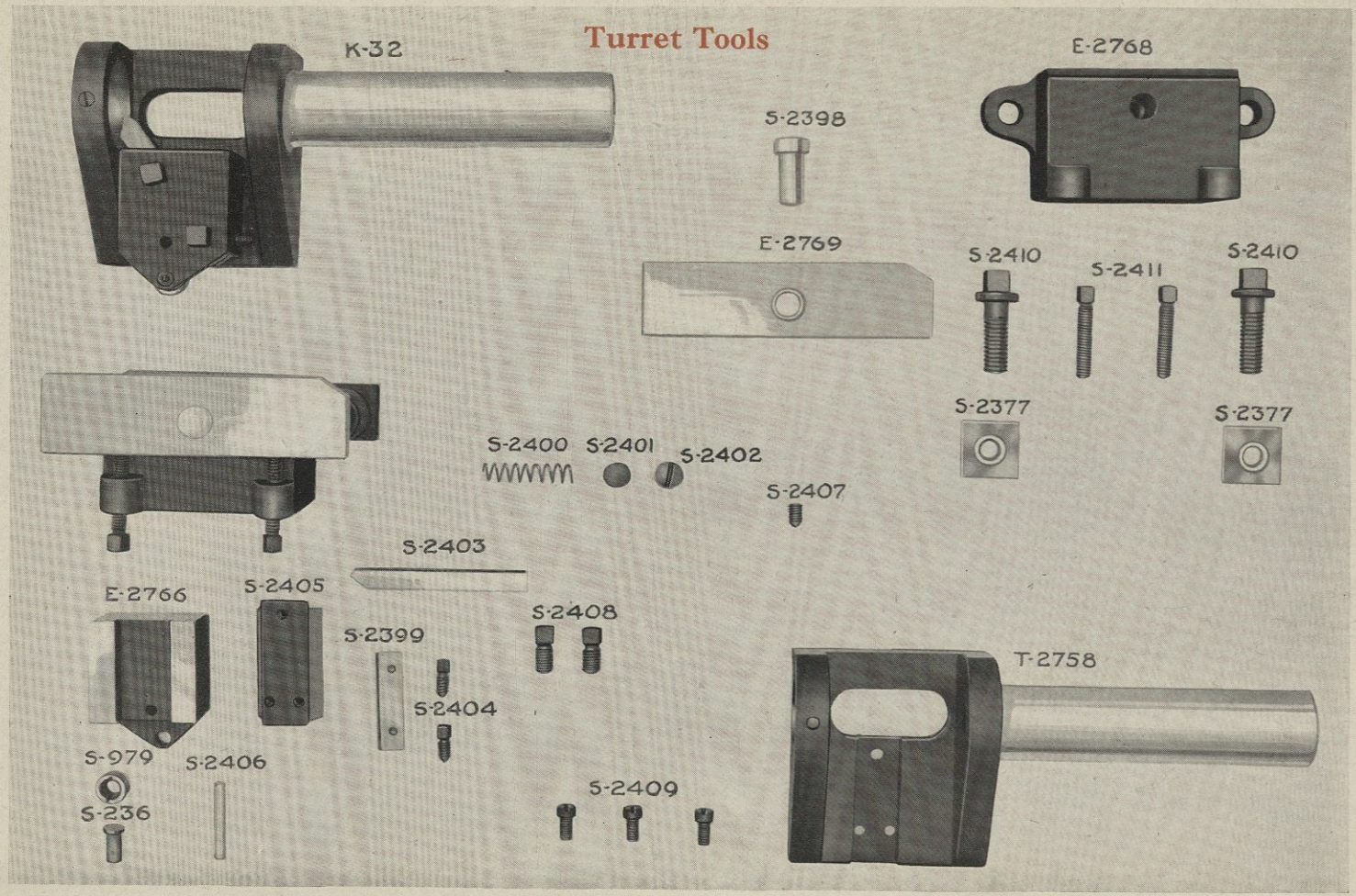
Various lengths of milling cuts (three).

Finished diameters.

Serial number of machine.

See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools



Turret Tools

K-32—Box Mill for Taper or Irregular Forms

This mill is fitted with a round bushing to act as a support for the stock.

The adjustable guide cam shown below the mill is mounted on the cross slide of machine and governs the taper or form to be milled by engaging the roll shown on the cutter block which is mounted on the slide of the mill.

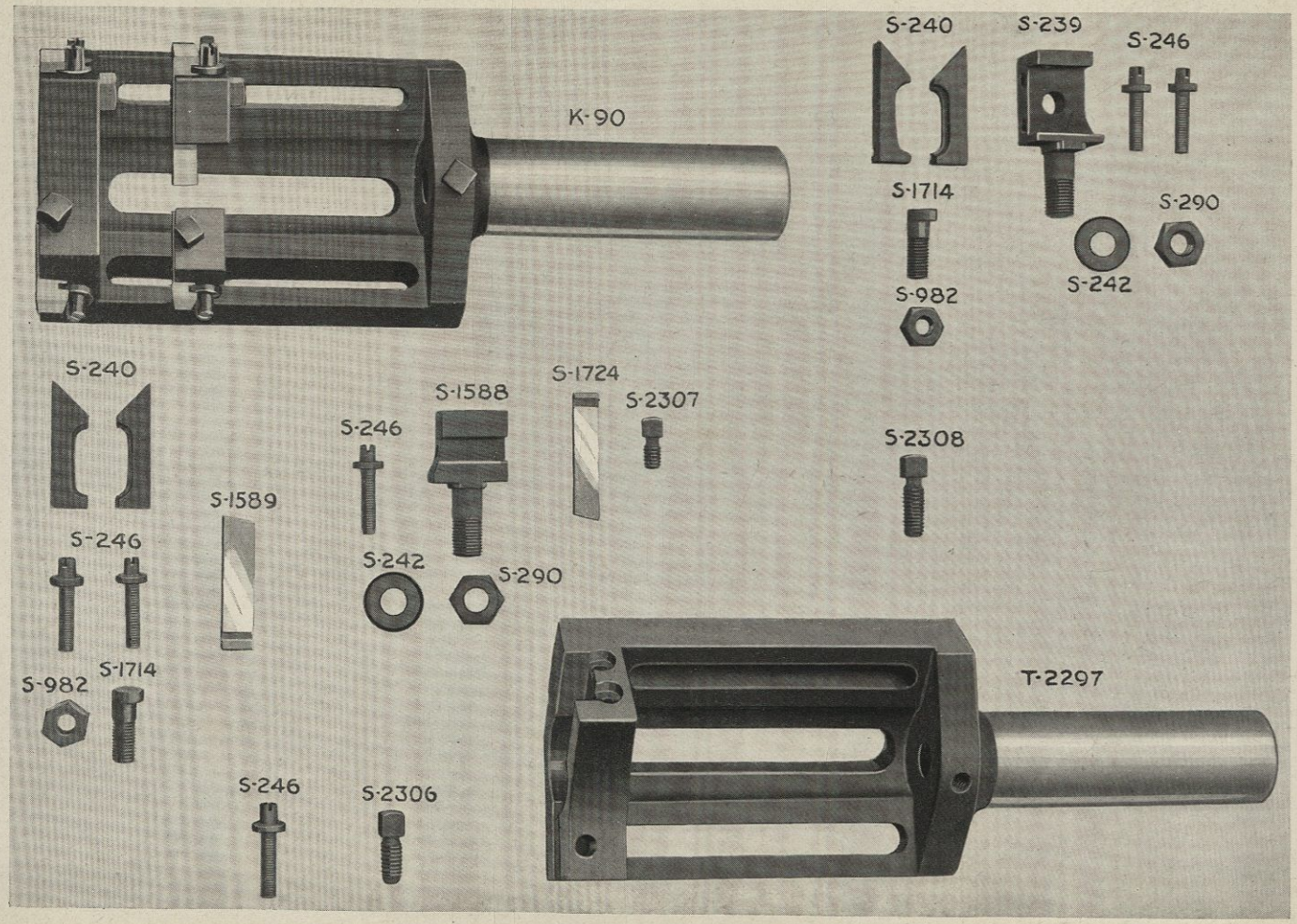
In ordering, specify the following:

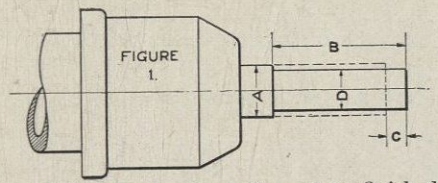
Size of hole in bushing.

Length to be milled.

Give serial number of machine.

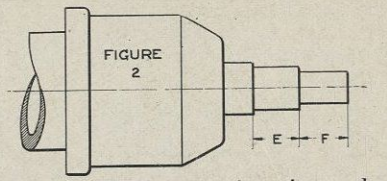
See pages 282, 283, 284 and 285 for telegraphic code.


K-90
S-240
S-239
S-246
S-1714
S-290
S-242
S-982
S-240
S-1588
S-1724
S-2307
S-246
S-2308
S-1589
S-246
S-242
S-290
S-982
S-1714
T-2297
S-246
S-2306



Turret Tools

K-90—Box Mill



This is a shaving mill used to finish diameters requiring extreme accuracy.

In ordering kindly furnish the following information:

The body, T-2297, varies in length and we can furnish standard mills for milling the following lengths on our various sizes and models of machines:

For the	3/8"	Model A and G Machines		2 1/4" only
" "	5/8"	" A and G	"	2 5/8" and 3 3/4"
" "	7/8"	" A	"	3 3/4" and 4 3/4"
" "	7/8"	" C	"	3 3/4", 4 3/4" and 6 3/4"
" "	1 1/4" and 2"	Model A	"	4", 5" and 6"
" "	1 1/4" and 2"	Model C	"	4", 5", 6" and 8"
" "	2 1/4"	Model A	"	5", 6" and 7"
" "	2 3/4"	" A	"	6", 7" and 8"

This is a two-cutter mill and can be used for shaving two or more shoulders. This mill is supplied regularly for cutting right hand.

When the stock is fed full length and you wish to mill close to the chuck hood, it will require the longest body we manufacture. (See Fig. 1 at B.)

If you fed the stock full length and wanted to mill a short cut shown at "C" with the same mill, it would be impossible, as you could not move the mill longitudinally far enough away to produce this short cut. Therefore you would need a shorter body mill.

In ordering a mill for such work as is shown in Fig. 2, the shoulders designated as E and F vary in length, and the adjustment of cutters would have to be considered. Send us sketches in such cases.

The smallest diameters we can shave on our various sizes and models of machines with this mill are as follows:

For the	3/8" and 5/8"	Model A and G Machines		3/16"
" "	7/8"	Model A and C	"	1/4"
" "	1 1/4" and 2"	Model A and C	"	3/8"
" "	2 1/4"	Model A	"	1/2"
" "	2 3/4"	Model A	"	9/16"

The largest diameters that will enter this mill for our various sizes and models of machines are as follows:

For the	3/8"	Model A and G Machines		1/2"
" "	5/8"	" A and G	"	3/4"
" "	7/8"	" A and C	"	1"
" "	1 1/4" and 2"	Model A and C Machines		1 3/8"
" "	2 1/4"	Model A	"	1 3/4"
" "	2 3/4"	" A	"	2 7/16"

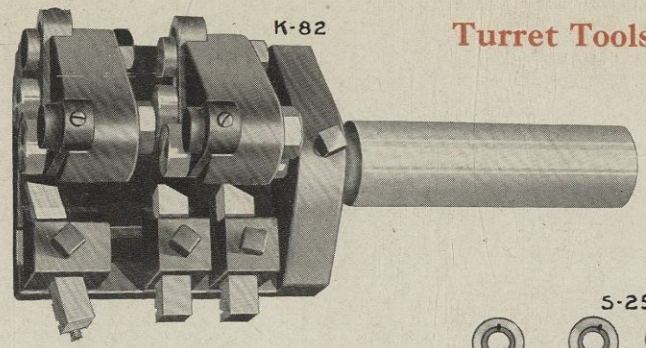
The mills for our 2 3/4" machines and up are very heavy, and in most cases we advise the use of the K-42 Overhanging Turret Turning Attachment. (See page 236.)

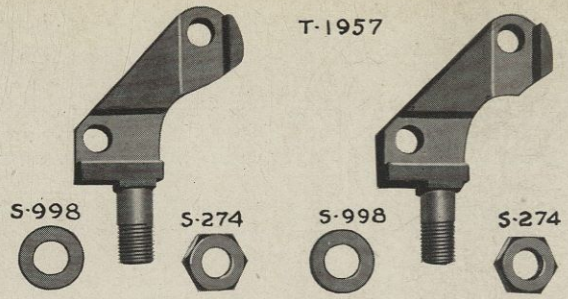
The above information means when ordering this mill we require the following data:

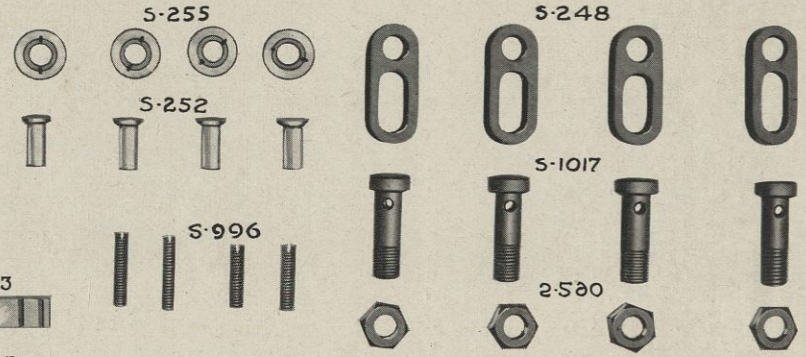
Diameter of stock to be milled, shown on Fig. 1 at A.
Length of the milling cut shown at B or C.
Finished diameter shown at D.
Give serial number of machine on which you wish to use the mill.

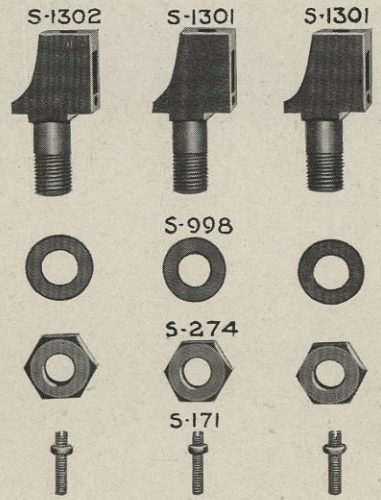
See pages 282, 283, 284 and 285 for telegraphic code.

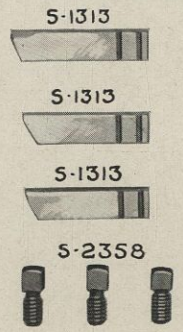
Turret Tools

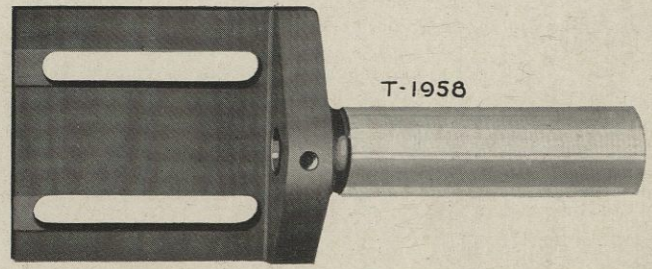












Turret Tools

K-82—Roller Rest Box Mill with Side Cutting Tools and Universal Adjusting Roller Rest

This mill can be used for roughing and finishing light work, where it is required to turn a number of diameters.

The roller rest may be adjusted to lead or follow the front cutter.

The tool posts have a limited adjustment on the two splines shown.

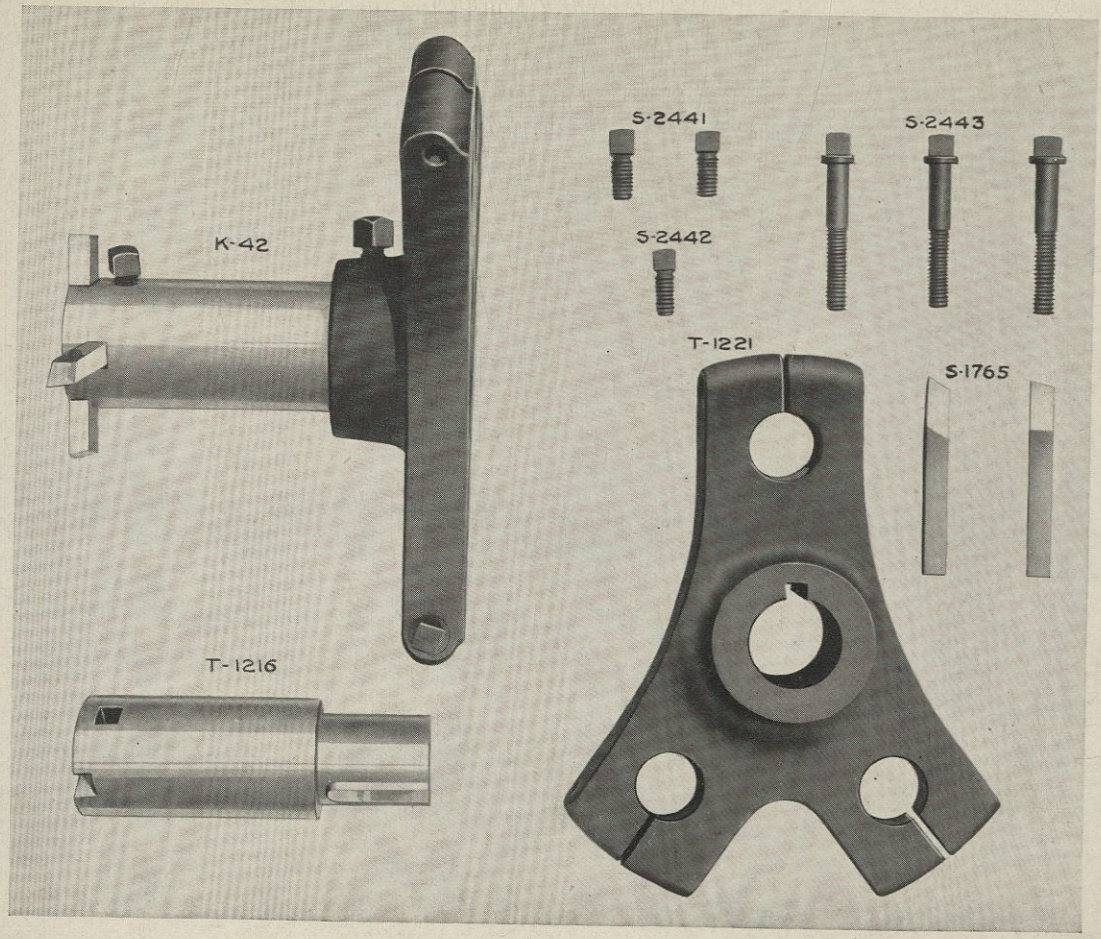
We have no standards for this mill, therefore it is necessary to furnish complete detailed sketches of the work you wish to produce when ordering.

This mill can be supplied with one or more cutters, and is arranged regularly for cutting right hand.

Always give serial number of machine upon which you wish to use this mill.

See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools



Turret Tools

K-42—Overhanging Turret Turning Attachment

This attachment is used for roughing and finishing large diameters, and in most cases on our 2¾-inch machines and up it is advisable to use this attachment instead of our box mills, as they are very heavy for the large machines and might interfere with other operations.

It is adaptable for turning one or more shoulders depending on the number of cutters we are able to locate in the cutter bar, No. T1216.

Turning cuts can be combined with either drilling, boring, reaming or counterboring operations.

This attachment is arranged to rough turn when No. 2 Turret Hole is in working position and finish turn when No. 3 Turret Hole is in working position. Therefore, any other combination you might require must be submitted to us when ordering.

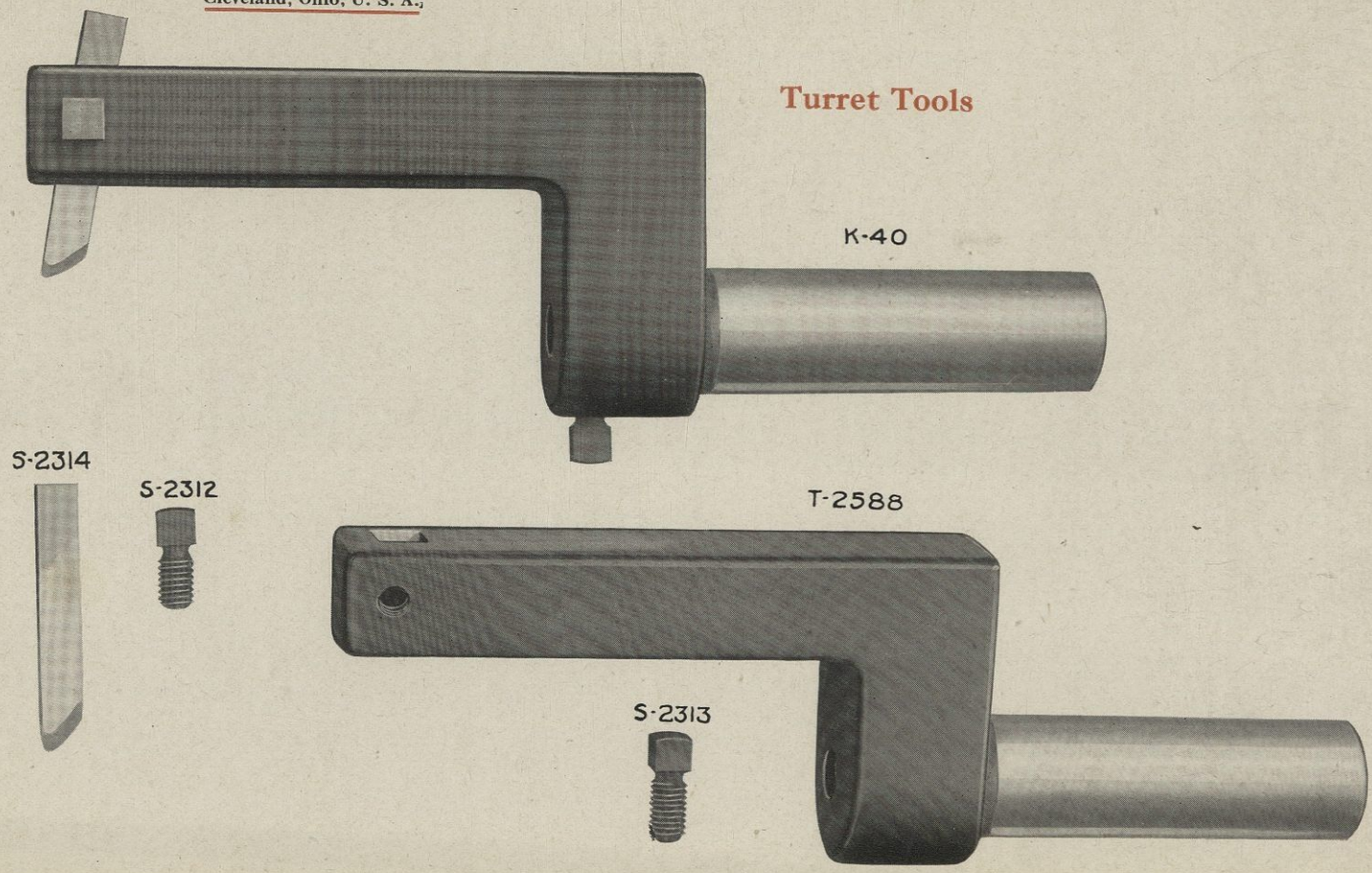
We furnish this attachment regularly with two cutters to turn right hand.

In cases where more than one shoulder is required to be turned, a blue print or sample of the work must be submitted so that the cutters can be properly spaced.

Give serial number of machine on which you wish to use this attachment when ordering.

See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools



Turret Tools

K-40—Overhanging Mill

This mill is used for light finishing cuts or removing scale from rough stock.

This tool is furnished regularly with a single cutter, but can be supplied with additional cutters if required to turn more than one shoulder. In all such cases blue prints or samples of work must be submitted.

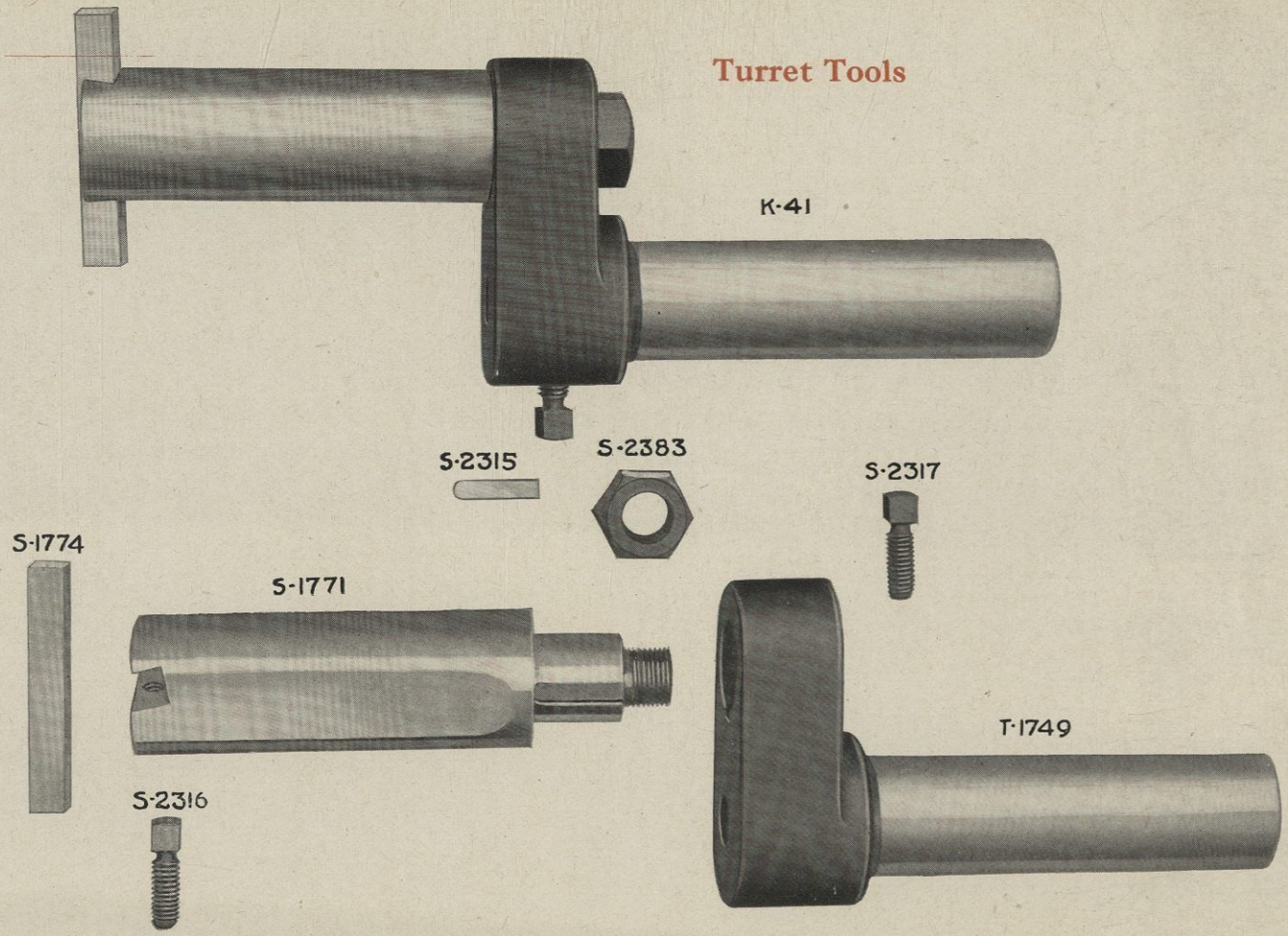
The hole in the shank of this mill is concentric with the outside diameter milled, which permits the combining of a centering, drilling or counterboring operation with the turning.

This mill is furnished regularly for right hand cutting.

Give serial number of machine on which you wish to use this tool when ordering.

See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools



Turret Tools

K-41—Overhanging Mill with Detachable Arm

This mill is used for light finishing cuts or removing scale from rough stock.

It is supplied regularly with a single cutter and bar to turn a cut the length of which is determined by the full milling stroke of machine on which you wish to use this mill.

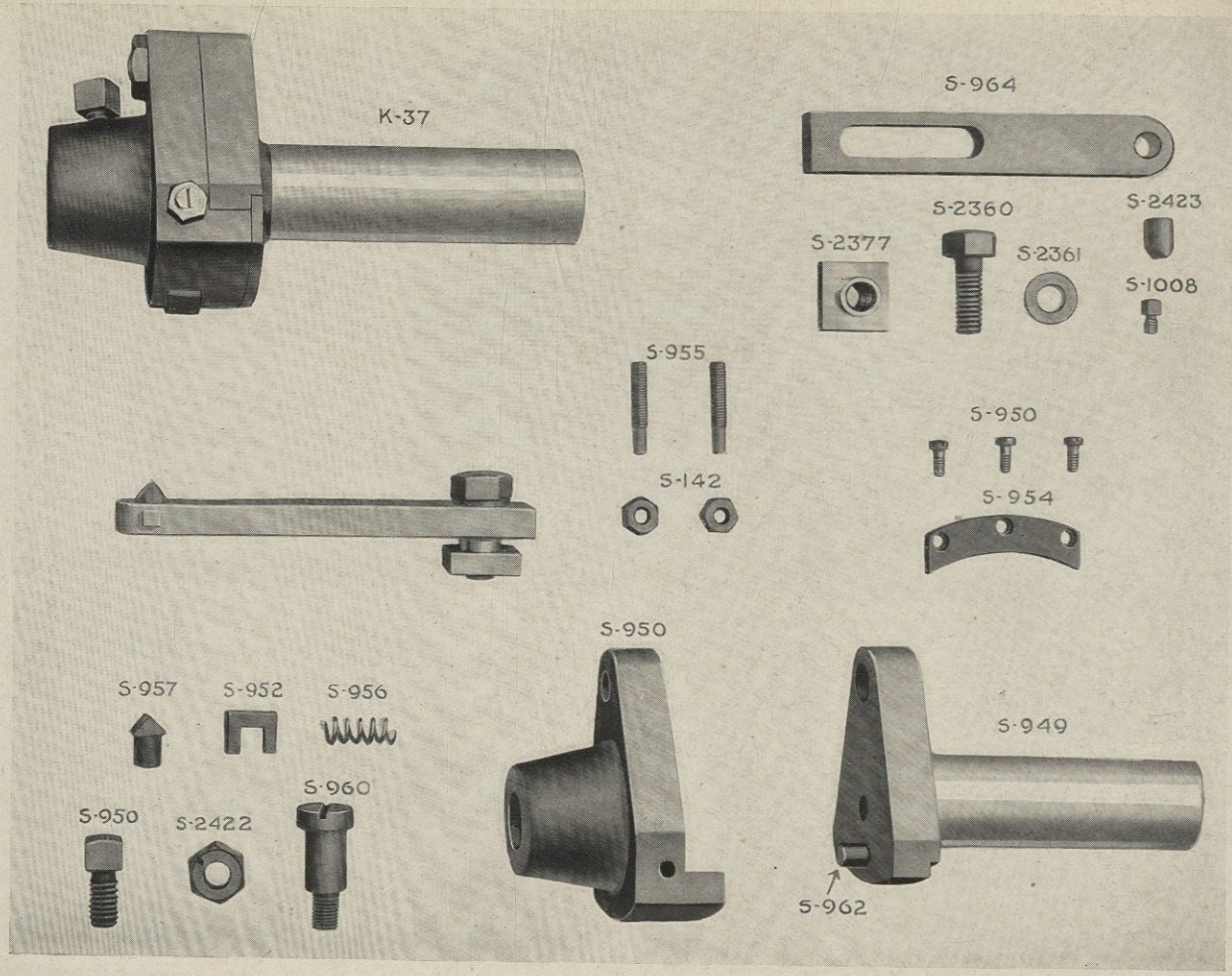
The detachable arm makes this mill quite flexible on account of our being able to furnish different length arms carrying one or more cutters.

Where special arms are required, kindly furnish us samples or blue prints of work you wish to handle.

Give serial number of machine on which you wish to use this tool when ordering.

See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools



Turret Tools

K-37—Swinging Recessing Tool Holder

This holder is used for light inside forming or recessing operations.

The cutter is not furnished with the holder unless ordered.

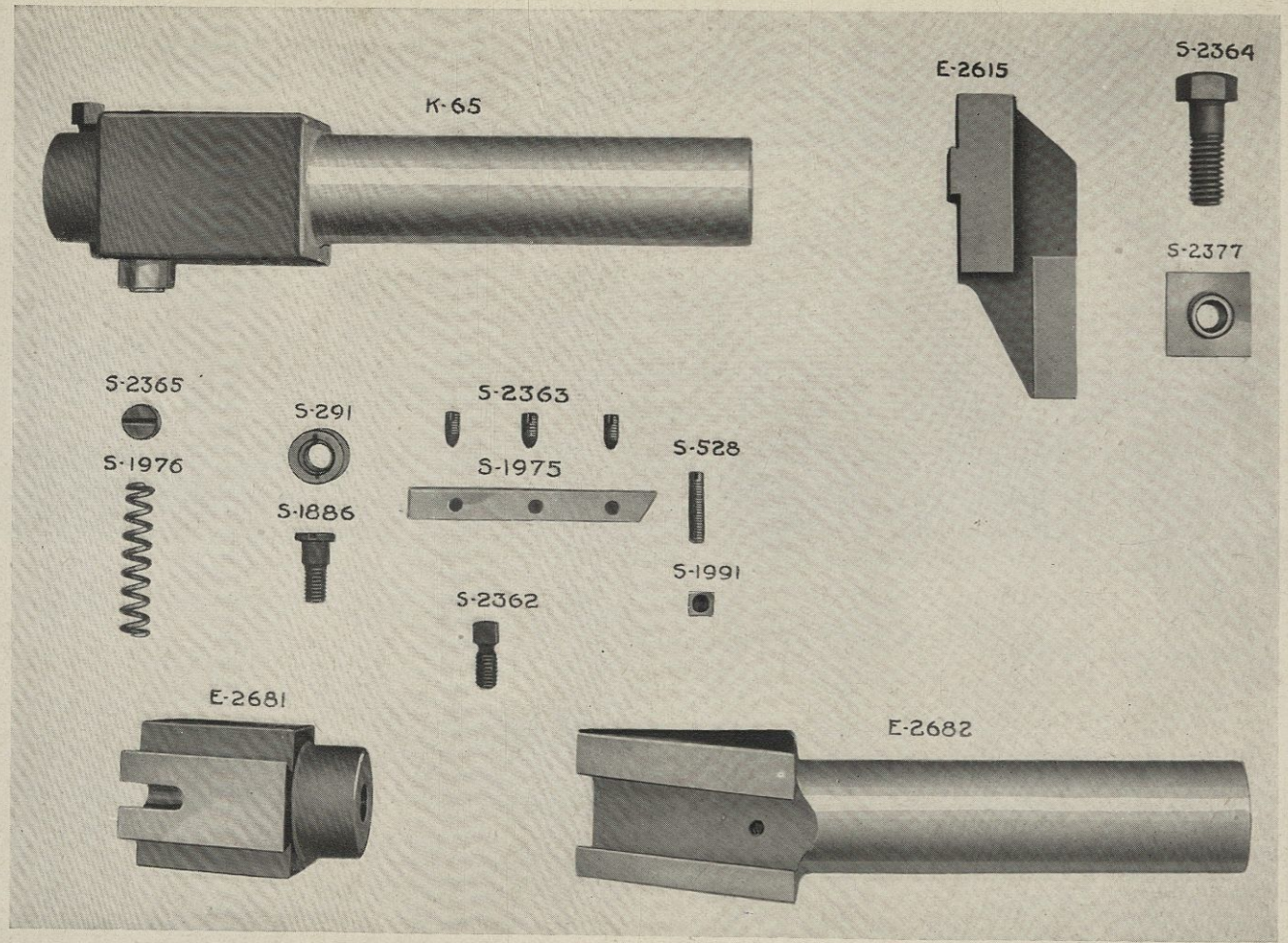
This tool can be used for either right or left hand cutting as required.

A special turret cam is required for the machine which permits the turret to stand in a forward position until the recessing operation is completed. We supply these turret cams standard length, and it is necessary to cut this cam to suit your work.

The action of the cutter is governed by the operating cam, No. S-964, which is placed on the cross slide of the machine.

Give serial number of machine on which you wish to use this holder when ordering.

See pages 282, 283, 284 and 285 for telegraphic code.


K-65
E-2615
S-2364
S-2377
S-2365
S-1976
S-291
S-1886
S-2363
S-1975
S-528
S-1991
S-2362
E-2681
E-2682

Turret Tools

K-65—Sliding Head Recessing Tool Holder

This tool is used for recessing or inside forming operations.

Where the nature of the work will not permit the cutting of the turret cam, and where accuracy is required, this holder is used instead of K-37 Swinging Recessing Holder.

The recessing tool is fed into the work by stopping the sliding head with the adjustable stop, No. E-2615, mounted on the cross slide while the turret is still feeding forward. This is a positive action on the work and is bound to produce accurate results.

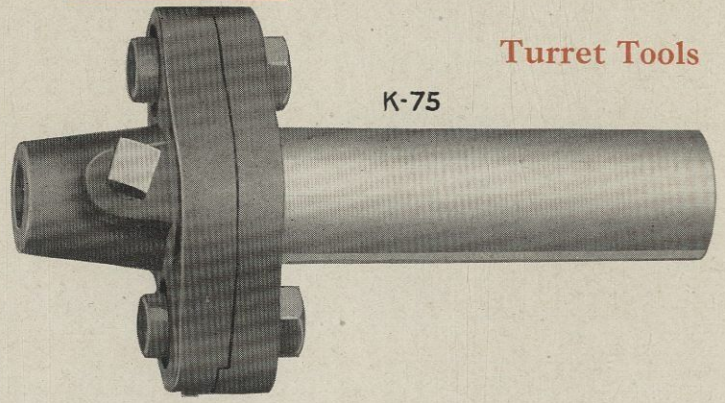
This holder can be used for right or left hand cutting.

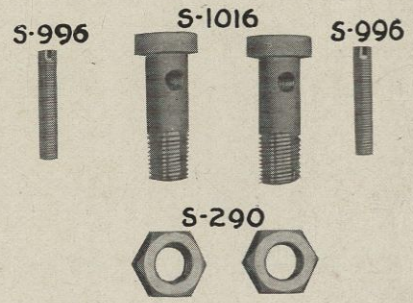
We do not supply cutters with holders unless ordered.

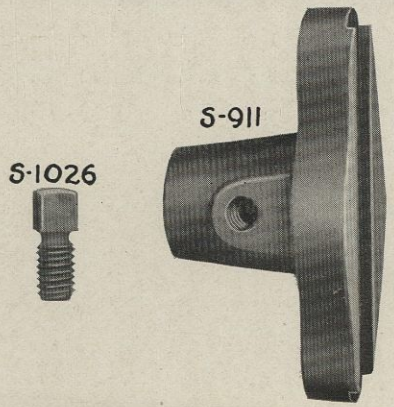
Give serial number of machine on which you wish to use this tool when ordering.

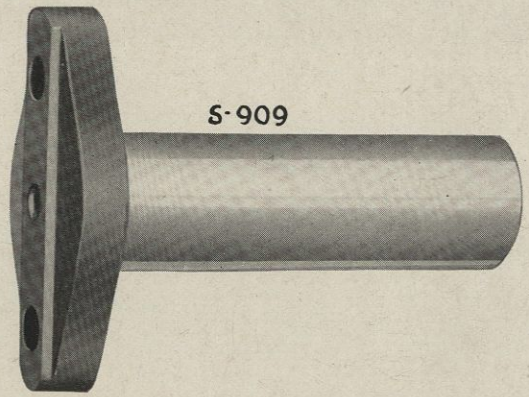
See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools









Turret Tools

K-75—Adjustable Boring Tool Holder

This holder is used to permit a simple adjustment of boring tools, where it is necessary that the hole in the part be absolutely concentric with the outside diameter.

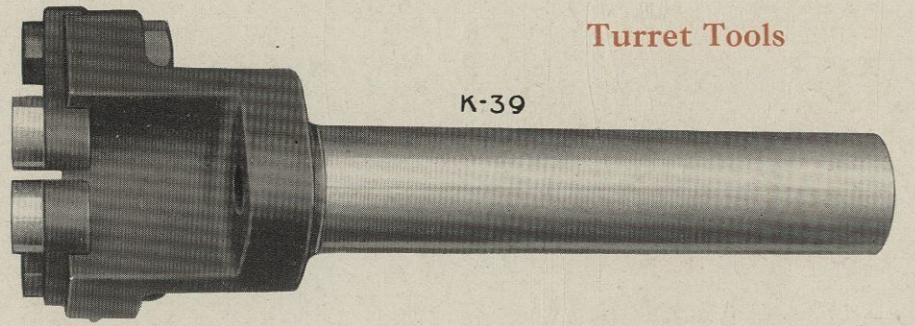
The method of adjusting this holder can be readily determined by studying the view on the opposite page.

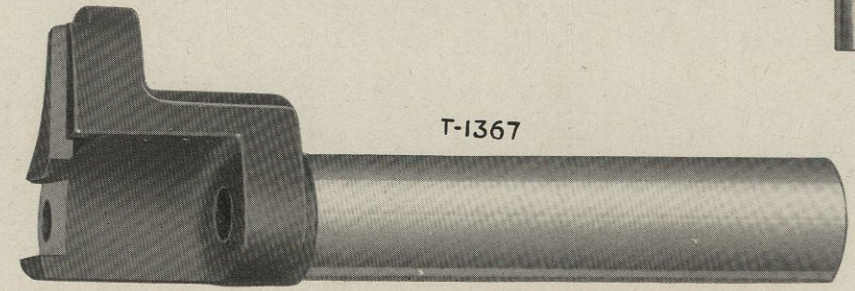
This holder may be used with either right or left hand boring tools.

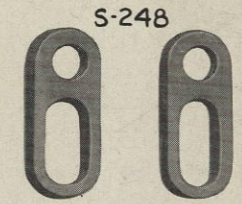
Give serial number of machine on which you wish to use this holder when ordering.

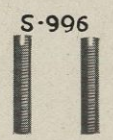
See pages 282, 283, 284 and 285 for telegraphic code.

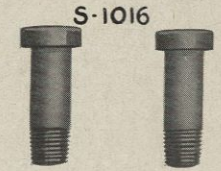
Turret Tools

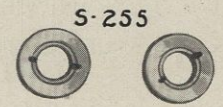


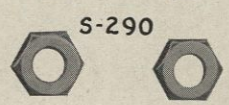


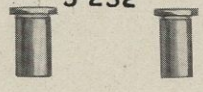












Turret Tools

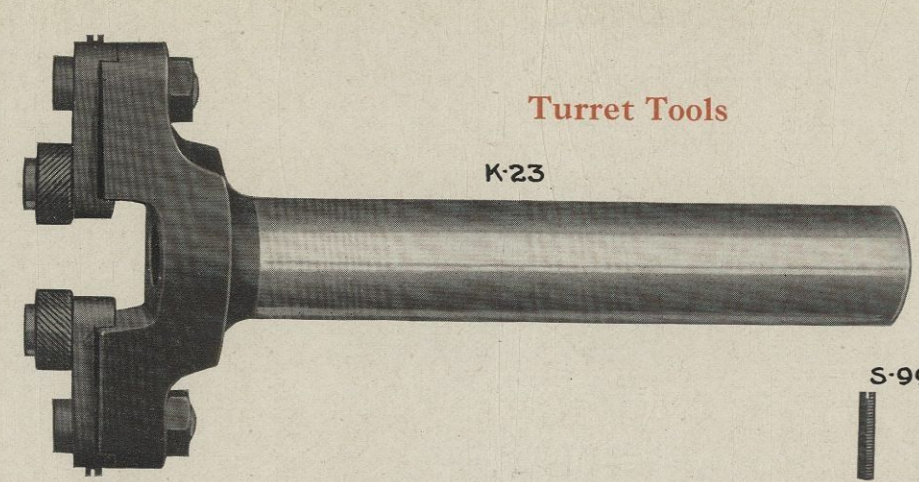
K-39—Roller Steady Rest

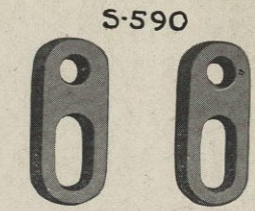
This tool is used for supporting heavy forming cuts.

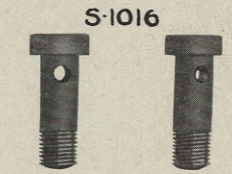
We require the diameter of stock and serial number of the machine to fill an order for this tool.

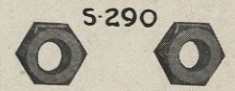
See pages 282, 283, 284 and 285 for telegraphic code.

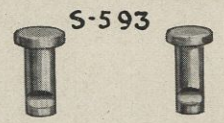
Turret Tools

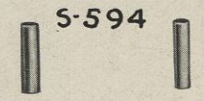


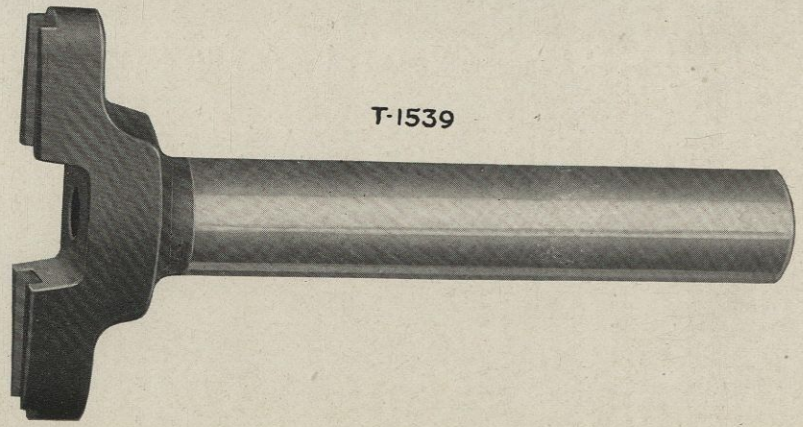












Turret Tools

K-23—Straddle Knurl Holder

This tool is used for long diameters or where a heavy knurl is required.

When ordering, specify the following:

Where knurling is required to be exact, give circular pitch of knurl and angle of teeth.

Diameter to be knurled.

Knurls.

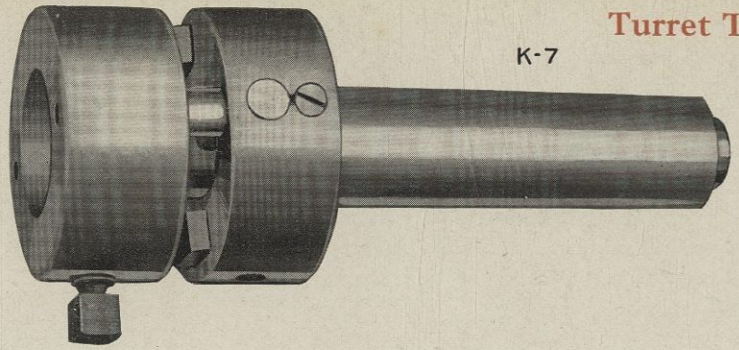
If standard, in the following way:

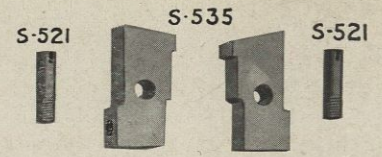
Straight knurl; whether coarse, medium or fine.

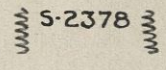
Diamond knurl; whether coarse, medium or fine.

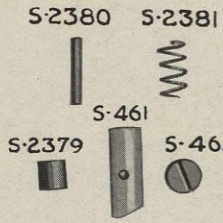
Give serial number of machine.

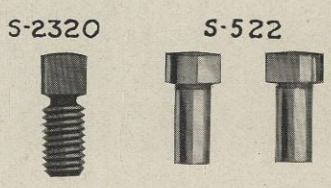
See pages 282, 283, 284 and 285 for telegraphic code.

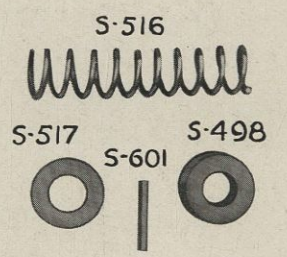

K-7

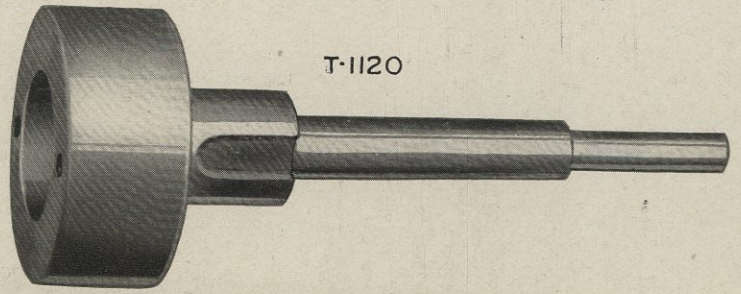

S-521
S-535
S-521

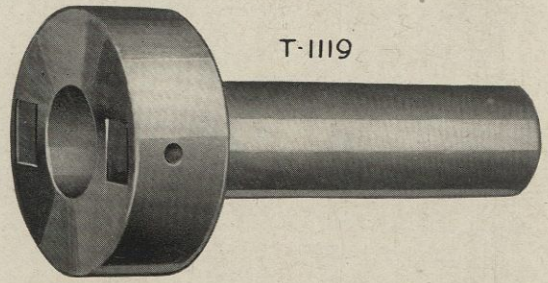

S-2378


S-2380
S-2381
S-461
S-2379
S-462


S-2320
S-522


S-516
S-517
S-601
S-498


T-1120


T-1119

Turret Tools

K-7 or 8—Combination Tap and Die Holders

Dies and Holders

When ordering taps, dies or chasers kindly specify style and pitch of thread, whether right or left hand, and material to be cut.

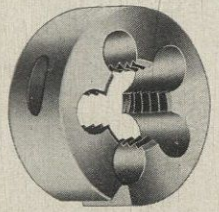
When ordering holder for taps, size of tap shank should be specified.

Button Dies, give diameter and thickness of blank.

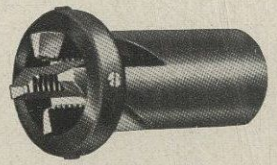
When ordering K-8 Button Die Holders, state diameter and thickness of die to be used.

Give serial number of machine in ordering K-7 or K-8 Die Holders.

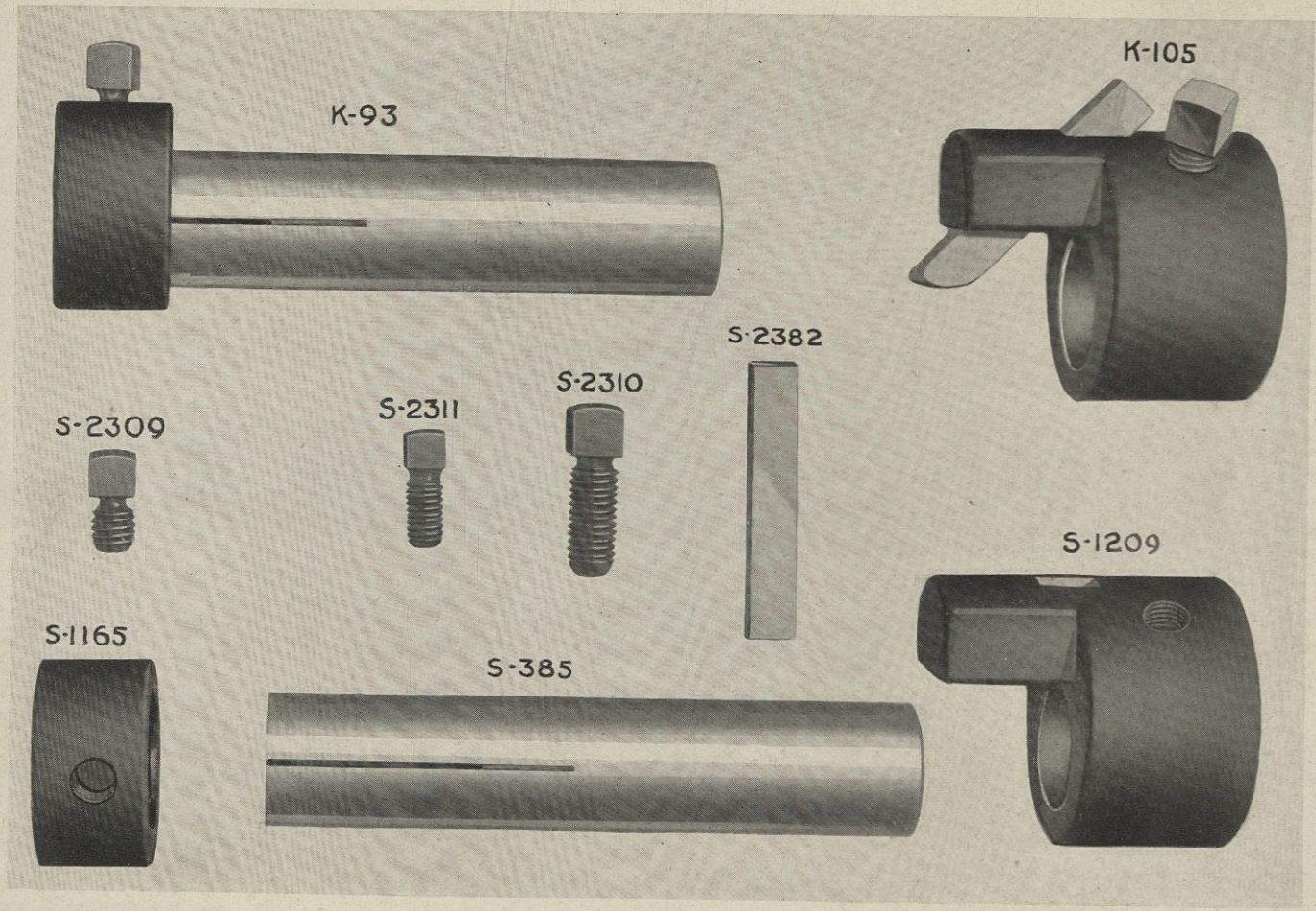
See pages 282, 283, 284 and 285 for telegraphic code.



K-86
Button Die



K-15
Spring Die


K-93
K-105
S-2382
S-2310
S-2311
S-2309
S-1209
S-1165
S-385

Turret Tools

K-93—Split Drill Holders, and K-105—Overhanging Chamfering Tool

K-93—Split Drill Holder

This tool is recommended for any work where the drill to be held exceeds the capacity of the K-9 Drill Chuck.

Size of drill should be given when ordering this holder.

Give serial number of machine.

K-105—Overhanging Arm

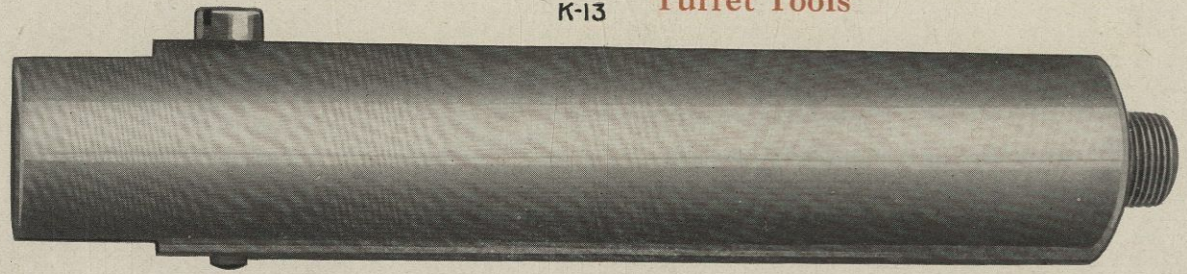
This tool is used in connection with our K-93 Split Drill Holder for chamfering corners and removing scale.

Give serial number of machine.

See pages 282, 283, 284 and 285 for telegraphic code.

Turret Tools

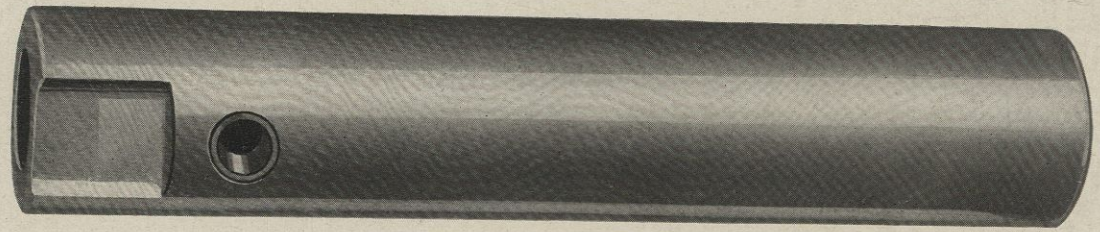
K-13



S-426

S-427

S-425



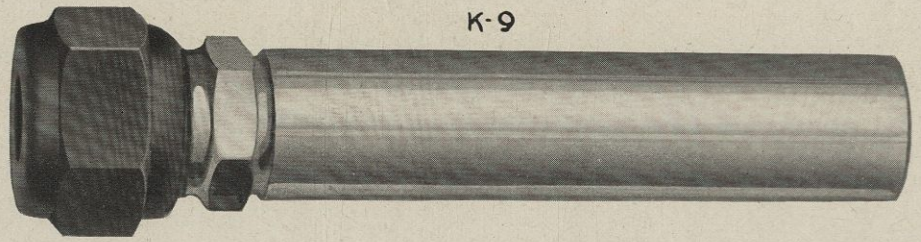
Turret Tools

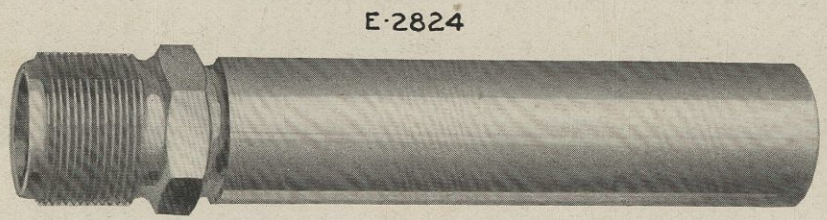
K-13—Reamer Holder

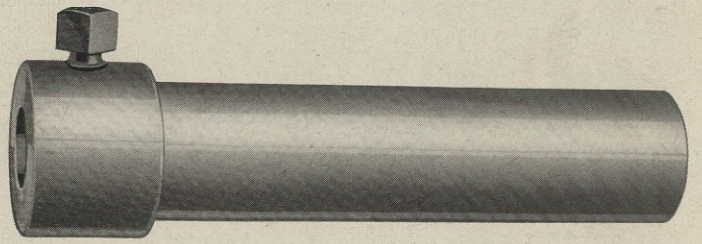
This tool is standard with us and can be ordered for any machine, providing the serial number is furnished.

See pages 282, 283, 284 and 285 for telegraphic code.

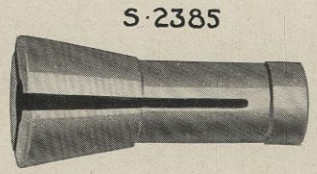
Turret Tools



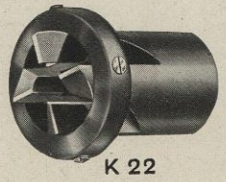




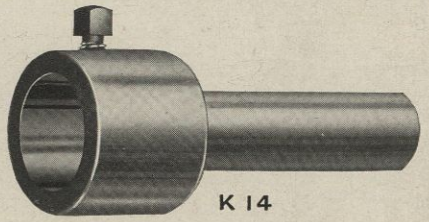
K-10—Drill Holder



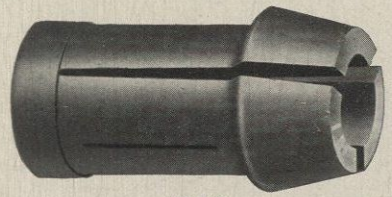
K-9—Drill Chuck—E and S numbers show parts for K-9



Hollow Mill



Hollow Mill Holder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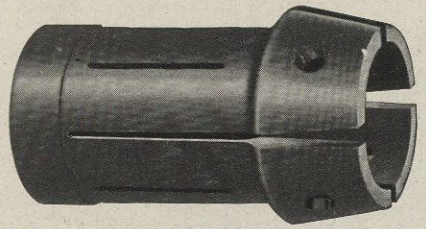
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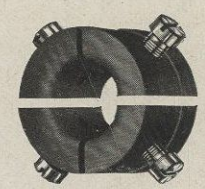
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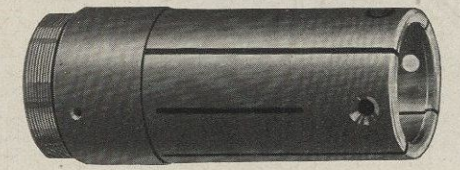
K 17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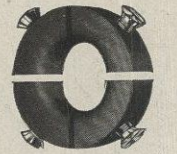

K 21

Chucks, Shells and Pads

Machines up to and including 1½-inch capacity use solid Chucks and Feed Shells.

On all machines including 2-inch and above, the sizes for which pads can be furnished are shown in table on page 262.

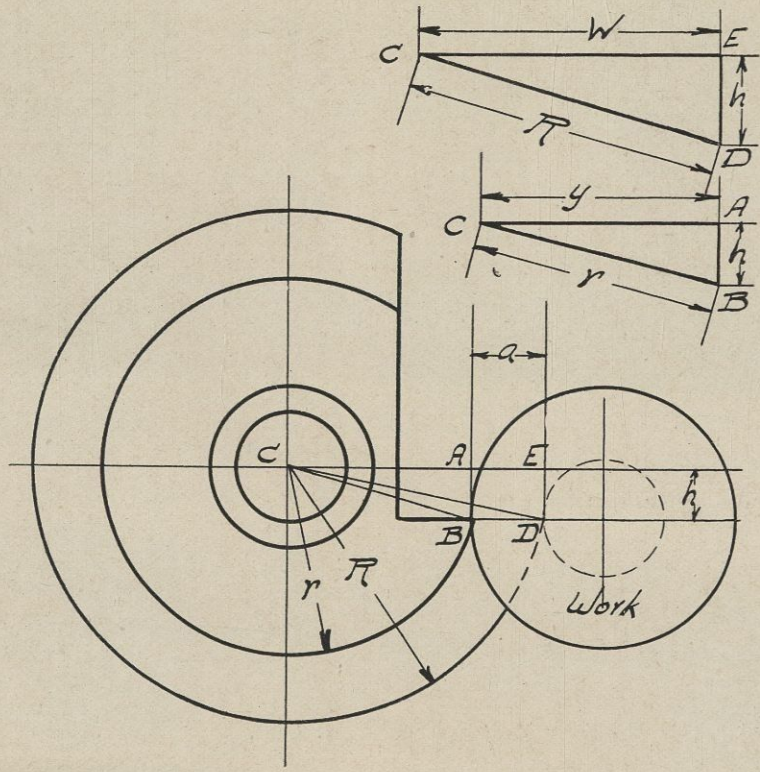
Give serial number of machine.

When ordering Chucks, Feed Shells or Pads for use on stock diameters not shown on page 262, the diameters given should be accurate to assist us in furnishing the proper equipment.

Specify whether Round, Square or Hexagon Chucks and Feed Shells or Pads are required.

See pages 282, 283, 284 and 285 for telegraphic code.

Circular Tool Formula



Rules for finding diameter of Forming Tools.

First find the value of W in the right triangle E C D.

$$W=\sqrt{R^2-h^2}$$

In which,

R=Radius of largest diameter cutter.

h=Distance center of tool is set, either above or below center of work.

Second, find the value of r in the right triangle A C B.

$$r=\sqrt{y^2+h^2}$$

In which,

y=W—a

a=Half the difference between the required diameters of the work.

2r=Required small diameter of cutter.

CONTENTS

Charts and General Information

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Spindle Capacities—Cleveland Automatic Machines

Machine		3/8"	3/8"-1/2"	3/8"-5/8"	5/8"	5/8"-3/4"	5/8"-7/8"	5/8"-1 1/16"	7/8"	7/8"-1 1/16"	7/8"-1 1/4"	7/8"-1 3/8"	1 1/4"	1 1/4"-1 3/8"	1 1/4"-1 1/2"	2"	2"-2 1/2"	2"-2 3/4"	2 1/4"	2 1/4"-2 3/4"	2 1/4"-3 1/4"	2 3/4"	2 3/4"-3 1/4"	2 3/4"-3 3/4"	4"	4 1/4"	5 1/2"	6 3/4"	7 3/4"
Round	Solid Shell	3/8	9/16	5/8	5/8	3/4	7/8	1 1/16	1 7/8	1 1/16	1 5/16	1 3/8	1 5/16	1 3/8	1 1/2	2 3/16	2 1/2	2 13/16	2 1/2	2 13/16	3 1/4	2 13/16	3 1/4	3 7/8	4 1/8	4 9/16	5 3/4	6 3/4	7 3/4
Hex.	Solid Shell	5/16	7/16	1/2	1/2	5/8	3/4	7/8	3/4	7/8	1 1/8	1 3/16	1 1/8	1 3/16	1 1/4	1 7/8	2 1/8	2 7/16	2 1/8	2 7/16	2 13/16	2 7/16	2 13/16	3 5/16	3 5/8	4	5	5 3/4	6 3/4
Square	Solid Shell	1/4	3/8	7/16	7/16	1/2	9/16	3/4	9/16	3/4	7/8	15/16	7/8	15/16	1 1/16	1 1/2	1 3/4	1 15/16	1 3/4	1 15/16	2 1/4	1 15/16	2 1/4	2 3/4	3	3 1/4	4	4 3/4	5 1/2
Round	Chuck Pads															1 15/16	2 1/4	2 3/8	2 1/4	2 3/8	3	2 3/8	3	3 3/4	4	4 1/4	5 1/2	6 3/8	7 3/8
Hex.	Chuck Pads															1 11/16	1 15/16	2	1 15/16	2	2 9/16	2	2 9/16	3 1/4	3 1/2	3 3/4	4 3/4	5 1/2	6 3/8
Square	Chuck Pads															1 3/8	1 9/16	1 5/8	1 9/16	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	2 7/8	3	3 7/8	4 1/2	5 1/4
Round	Feed Shell Pads															1 15/16	2 1/4	2 3/8	2 1/4	2 3/8	2 7/8	2 3/8	2 7/8	3 3/8	4	4 1/4	5 1/2	6 3/8	7 3/8
Hex.	Feed Shell Pads															1 11/16	1 15/16	2	1 15/16	2	2 1/2	2	2 1/2	2 15/16	3 1/2	3 3/4	3 7/8	5 1/2	6 3/8
Square	Feed Shell Pads															1 3/8	1 9/16	1 5/8	1 9/16	1 5/8	2	1 5/8	2	2 3/8	2 7/8	3	4 3/4	4 1/2	5 1/4

The figures for Hex. and Square stock are taken from a table of stock sizes differing 1/32" and the sizes are kept as close to diameter of corresponding round stock as possible.

In case absolute accuracy is required, use following formulas and figures.

Diameter over corners of Hex. = 1.155 × distance across flats.

Diameter over corners of Square = 1.414 × distance across flats.

WHEN ORDERING MACHINES AND TOOLS KINDLY GIVE FOLLOWING INFORMATION

1. MATERIAL:

Kind—giving physical qualities if possible—rough or smooth drawn.
Size of material from which parts are to be made.

2. OPERATIONS:

THREADING—Requirements

Style and Pitch of Threads.
Necks or clearances at shoulders must be wide enough to allow for throat of die.
External or internal threading—See spindle drives, pages 185, 186, 187 and 188.

HOLES

Drilled?
Reamed?
Bored and Reamed?
Tolerances allowed?
Concentricity?

OUTSIDE DIAMETERS—Whether shaved or not shaved?

Tolerances allowed?
(When too close accuracies are asked for and not required, it means less output and greater tooling cost.)

WHEN WORK IS GROUND

Necks or clearance at shoulders should be allowed. Where we need not be particular in machining piece to size when ground, it means greater output.
Grinding allowance?

MAGAZINE WORK

Holes cored?
When shapes are right, pieces should be cast double. If not double, chucking lug of ample size must be considered.
Drawings must show where castings are to be machined.
Send rough casting as well as finished piece.

3. ESTIMATES

Drawings must be plainly marked. Samples must be securely tagged, giving full information as above.

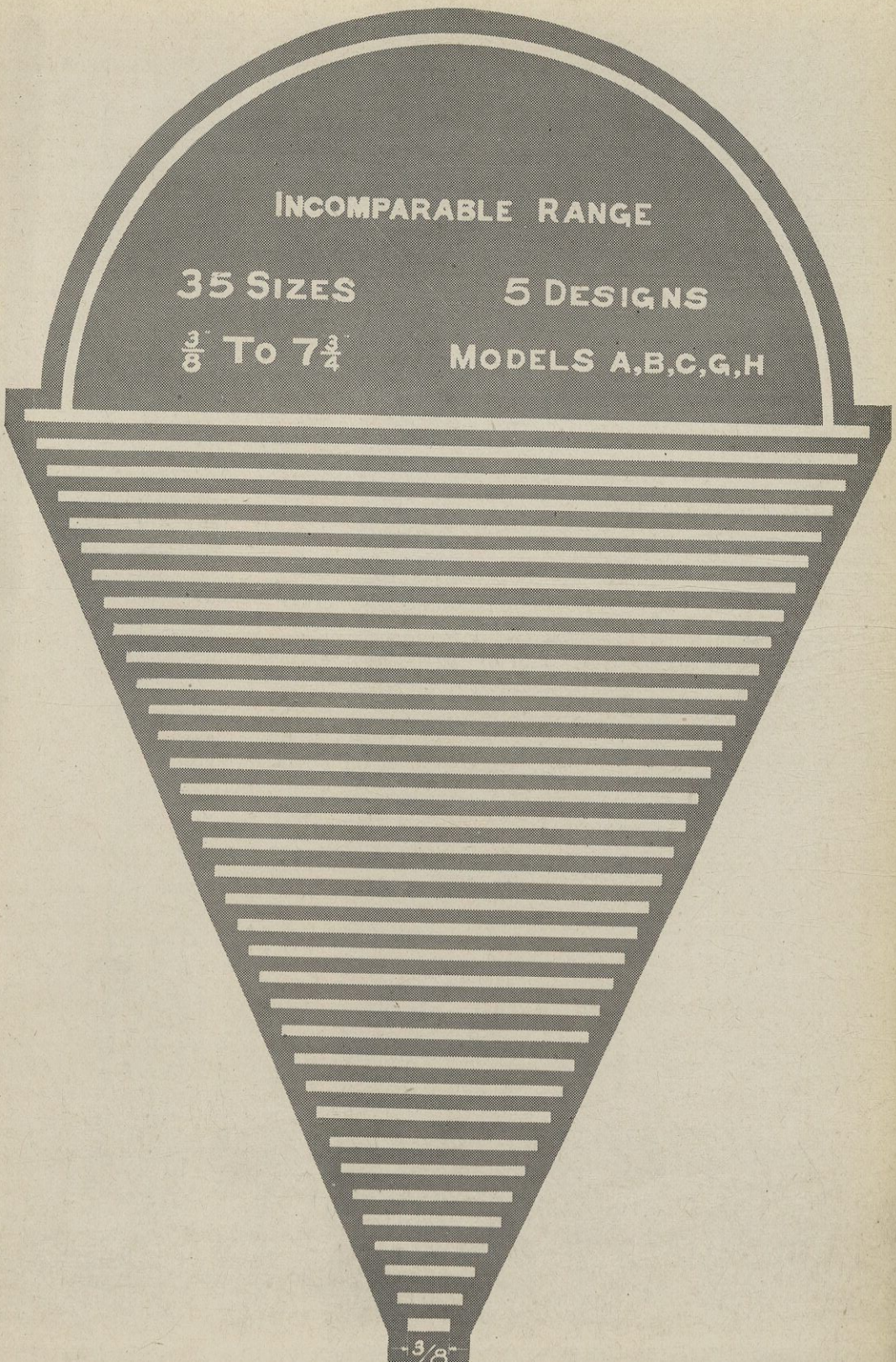
4. Give size and speed of line shaft.

5. When tools are ordered with machines, sufficient time should be allowed us to make the test, as shipping machines in advance of special tools has proven detrimental and should be discouraged.

6. WHEN ORDERING MACHINE PARTS:

To avoid delays, always refer to our pamphlet of Component Parts and indicate by number the part required—also give serial number of machine—find same on front of cross slide.
In ordering differential gears for machines, we require the number of teeth, pitch and bore.

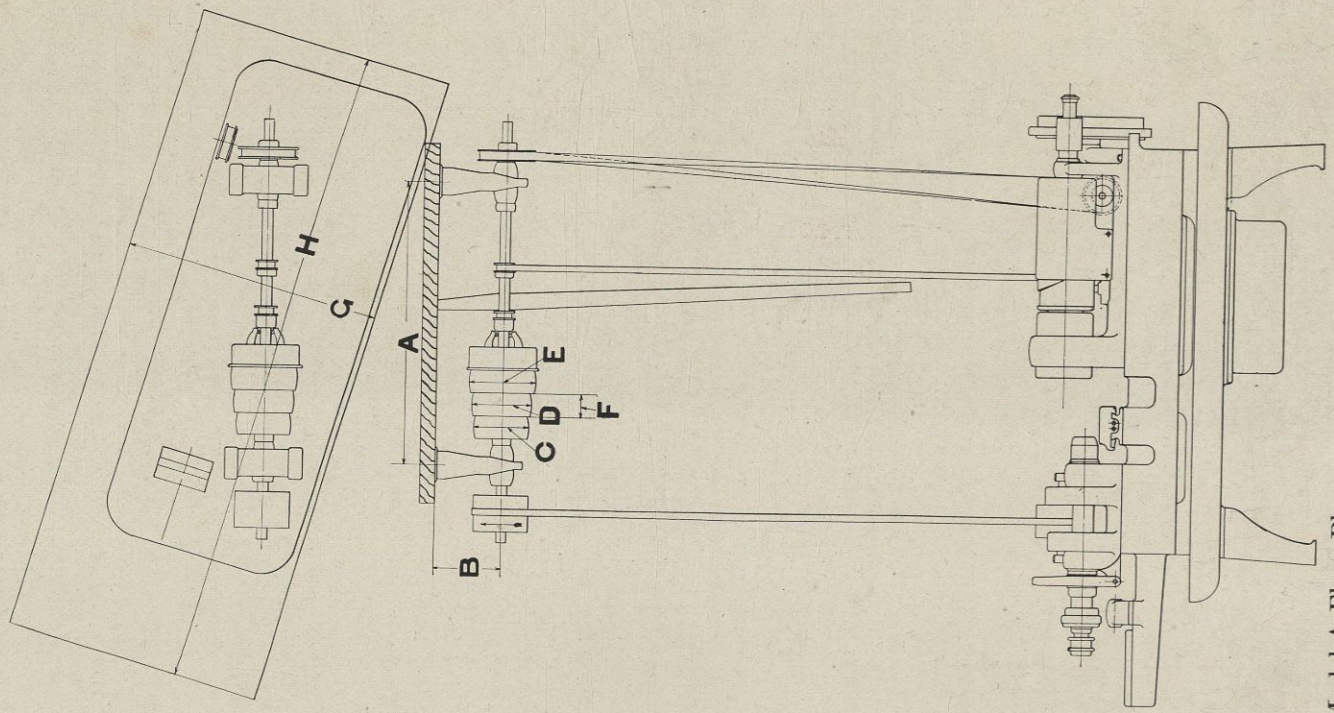
7. See Instructions for ordering Standard Tools on pages opposite cuts, beginning with page 203 to page 260.


INCOMPARABLE RANGE
35 SIZES
5 DESIGNS
3/8 TO 7 3/4
MODELS A,B,C,G,H
3/8"

Incomparable Range

The cut on the opposite page was placed there to better illustrate the great range of CLEVELANDS, from 3/8 to 7 3/4 and thirty-five different sizes.

We can, on our 3/8-In. machine, handle a bar from 1/8 inch up to 3/8 inch and on our 7 3/4-In. machine we can successfully handle a bar from 5 1/2 inches to 7 3/4 inches. Our range is so great that we thought it necessary to show a cut of this kind to impress the reader with the fact that the heading "Incomparable Range" fits our case exactly.



Model A Floor Plan

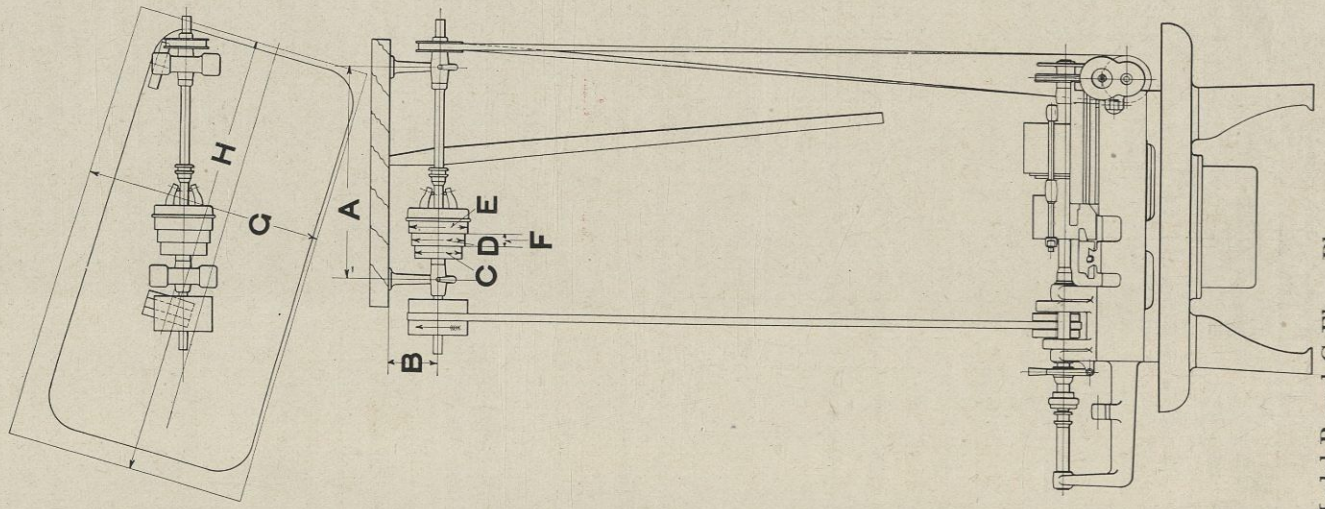
Turret Machines—Model A

Mach. Size	3/8″	5/8″	7/8″	1¼″	2″	2¼″	2¾″	4¼″ and 5½″	6¾″	7¾″
A	22″	35″	41½″	51″	51″	56″	60½″	71¾″	82¾″	82¾″
B	13″	13″	12″	12″	12″	12″	12″	12″	12″	12″
C	8″	8″	8″	8″	10″	10″	11″	12½″	12½″	12½″
D	9″	9″	9″	9″	11″	11″	12½″	14″	14″	14″
E	10″	10″	10″	10″	12″	12″	14″	15½″	15½″	15½″
F	2⅛″	2⅛″	3⅛″	3⅛″	4⅛″	4⅛″	4⅛″	5¼″	5¼″	5¼″
G	2′6″	3′0″	3′5″	3′10″	3′10″	4′3″	5′4″	5′8″	5′8″	5′8″
H	5′1½″	6′6″	7′11″	9′4½″	9′8½″	10′11″	13′0″	14′9″	16′6″	16′6″

Cone Step Revolutions per Minute

C	566	533	533	462	450	450	436	436	436	436
D	480	450	450	390	390	390	360	360	360	360
E	410	385	385	330	341	341	300	300	300	300

Set machines, sizes from 3/8″ to 2¾″, on an angle of 16 degrees from center line of countershaft.
Set machines, sizes from 4¼″ to 7¾″, on an angle of 10 degrees from center line of countershaft.
All machines with Geared Head to have open spindle driving belt.
All machines with High Speed Head to have one open and one crossed spindle driving belt.
All feed driving belts for machines smaller than 4¼ inches to be open quarter turn.
All feed driving belts for machines 4¼ inches and larger to be crossed quarter turn.
Height from floor to center of spindle on all machines, 42 inches.
For all machines 4¼ inches and larger countershaft runs in opposite direction to that indicated in drawing.



Model B and G Floor Plan

Plain Machines—Model B and G

Mach. Size	3/8″	5/8″	1¼″	2″	1¼″ 18″ Feed	2″ 18″ Feed
A	22″	32″	42½″	42½″	59″	59″
B	13″	13″	12″	12″	12″	12″
C	8″	8″	8″	10″	8″	10″
D	9″	9″	9″	11″	9″	11″
E	10″	10″	10″	12″	10″	12″
F	2⅛″	2⅛″	3⅛″	4⅛″	3⅛″	4⅛″
G	2′1″	2′9″	3′8″	3′8″	4′6″	4′6″
H	4′3″	5′5½″	7′4″	7′4″	8′6″	8′6″

Cone Step Revolutions per Minute

C	566	533	462	450	462	450
D	480	450	390	390	390	390
E	410	385	330	341	330	341

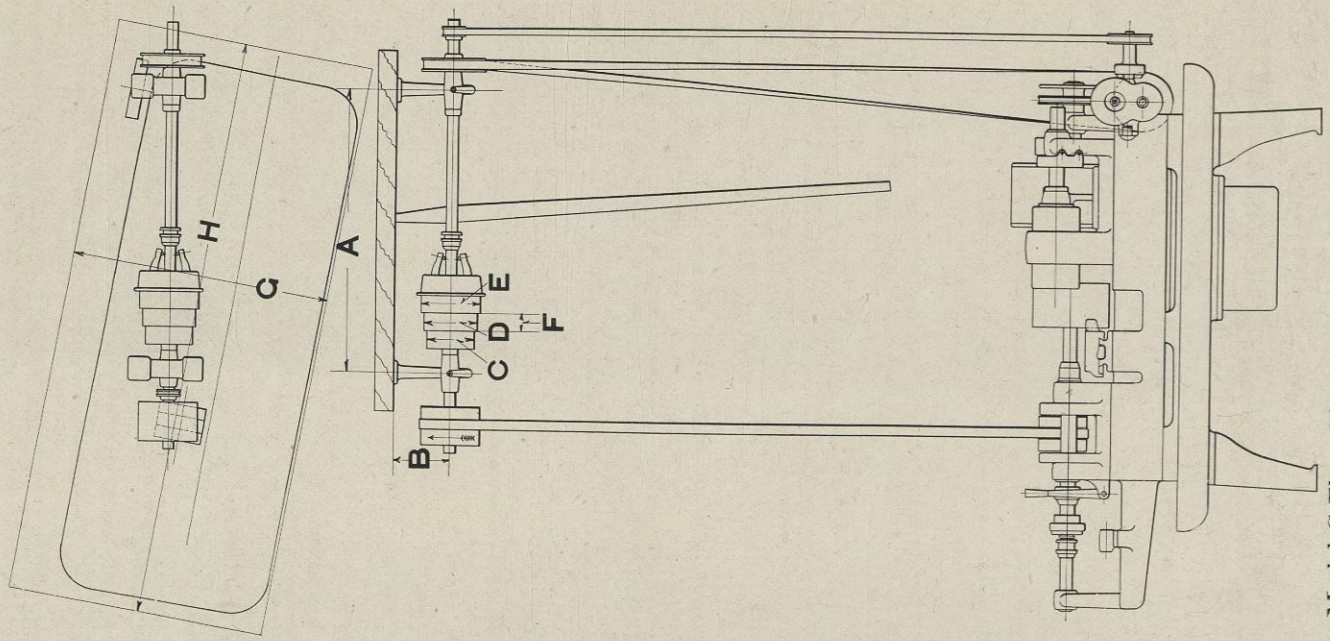
Set machines on an angle of 16 degrees from center line of countershaft.

All machines with Geared Head to have open spindle driving belt.

All machines with High Speed Head to have one open and one crossed spindle driving belt.

All feed driving belts to be open quarter turn.

Height from floor to center of spindle on all machines 42 inches.



Model C Floor Plan

3-Hole Turret Machines—Model C

Mach. Size	7/8″	1¼″	2″							
A	44½″	53″	53″							
B	12″	12″	12″							
C	8″	8″	10″							
D	9″	9″	11″							
E	10″	10″	12″							
F	3⅛″	3⅛″	4⅛″							
G	3′6″	3′7″	3′7″							
H	6′9″	8′2″	8′2″							

Cone Step Revolutions per Minute

C	533	462	450							
D	450	390	390							
E	385	330	341							

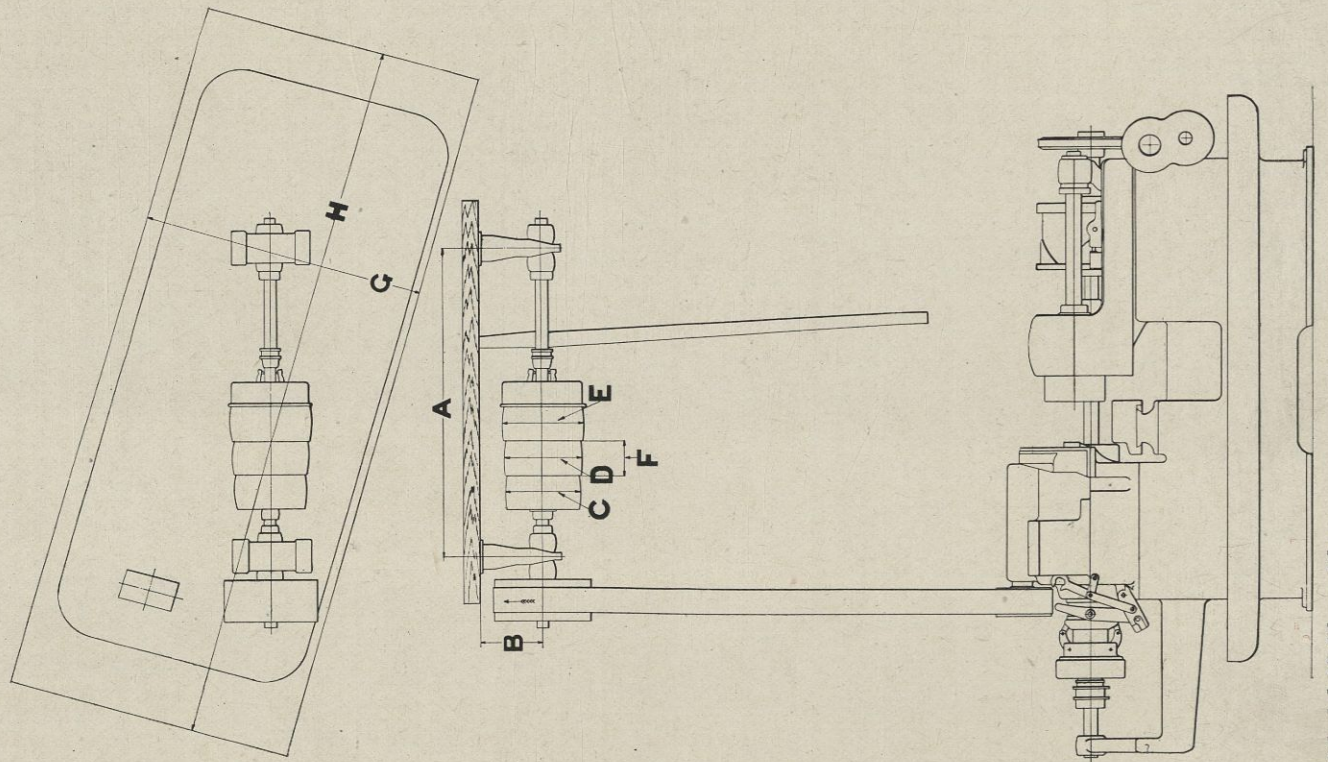
Set machines on an angle of 16 degrees from center line of countershaft.

All machines with Geared Head, to have open spindle driving belt.

All machines with High Speed Head, to have one open and one crossed spindle driving belt.

All feed driving belts to be open one quarter turn.

Height from floor to center of spindle on all machines is 42 inches.



Model H Floor Plan

Heavy Type, 3-Hole Turret Machines—Model H

Mach. Size	4″	5½″								
A	42″	42″								
B	12″	12″								
C	12½″	12½″								
D	14″	14″								
E	15½″	15½″								
F	5¼″	5¼″								
G	6′0″	6′6″								
H	11′10″	12′10″								

Cone Step Revolutions per Minute

C	436	436								
D	360	360								
E	300	300								

Set machines on an angle of 10 degrees from center line of countershaft.

All machines to have open spindle driving belt.

Height from floor to center of spindle on all machines is 42 inches.

General Information

Chuck

Turn binding nut on rear of spindle about three turns to the left to release compression collar, and if the grip is too tight turn the compression collar to the left—if too loose, to the right. Tighten binding nut while chuck is open and before testing the grip on stock.

Stock Feed (Model A)

The length of stock feed is regulated by adjusting the feed rod head along the stock feed rod, measuring from the face of the feed rod support to face of feed rod head.

Stock Feed (Model B)

On 3/8" and 5/8" machines including the increased spindle capacities, cams having elongated holes are employed instead of segments. A long and short bushing is also supplied on the cam shaft between the chuck operating and stock feed drums. When the adjustment cannot be made through the cams, the short bushing should be placed on the left or outer side of the stock feed drum and stock forwarding cam moved to the left. On the larger sizes, including Model C, segments are supplied, and variations in length of feed are made by adjusting the segment longitudinally along the cam shaft.

Double Camming

When the length of work is greater than can be accomplished in one feeding, or so that two pieces can be finished in one cycle of the cam shaft, double stock feed can be supplied that will permit two stock feedings.

Double belt shifter dogs can also be furnished where the part to be made demands changing the spindle speed twice in one cycle of the cam shaft.

General Information—Continued

Cross Slide Cams (Model A)

These cams control the movements of the cross slide and are made with standard angles to suit general conditions. They are adjustable around the circumference of the drum and their location will depend upon the tooling employed as well as the combinations to be effected.

Tool Posts (All Models)

Circular tool posts are designed so that the center line of bolt hole is either above or below the center line of spindle in order to provide clearance for circular tools, and are marked high and low.

The high post is employed where the cutting edge of a tool is up and the low post when down. This same rule also applies to posts designed for flat tools.

Feed Tube Bushing

All models are supplied with two bushings in the feed tube, one in the outer end and one just back of the feed shell. The bore of these bushings should be $\frac{1}{16}''$ larger than the diameter of the stock used. This arrangement supports the bar as it passes through the tube and eliminates the possibility of a cramping action between the feed shell and the chuck, and also serves as a guide when placing the new bar in the machine.

General Information—Continued

Belt Shifter

The belt shifter is both positive and instantaneous in its action. It is controlled by dogs operated from the cam shaft. In setting the belt shifter, turn the machine to the position where the belt is to shift and set the dog against the plunger. Partially tighten, and with a soft hammer, tap the dog until the belt shifts; then clamp securely in place.

In tapping or threading operations where a tap or solid die is employed, the belt shifter should be set to reverse the spindle after the turret has moved about $\frac{1}{16}''$ on its backward stroke.

Turret Head Adjustment

The turret heads of both Model A and C machines are adjusted along the bed of the machine by means of a screw and nut at the rear end of the bed. The turret tool having the greatest body length should determine the location of the head. On the Model C machine, the cam drum must always be moved with the turret head.

Indexing (Model C)

The turret on this type of machine may be indexed in any position, and as the cams for releasing the locking plunger and indexing the turret are cast integral, provide a very simple means of adjustment.

CONTENTS

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Diameter and Length Codes	284
Specification Codes	285

Code Words for All Models of Machines

M–M	Machine Sizes	Model A	Model B	Model C	Model H	Model E
10	3/8"	Fabric	Absolute			
10	3/8" With Slotting Device	Fabulous				
12	3/8"- 1/2"	Fabricate	Admiral			
12	3/8"- 1/2" With Slotting Device	Facade				
16	3/8"- 5/8"	Facar	Ampute			
16	3/8"- 5/8" With Slotting Device	Facared				
16	5/8"	Face	Amputate			
16	5/8" With Slotting Device	Faculty				
19	5/8"- 3/4"	Faced	Anchor			
19	5/8"- 3/4" With Slotting Device	Facete				
22	5/8"- 7/8"	Facial	Android			
22	5/8"- 7/8" With Slotting Device	Facient				
22	7/8"	Facies	Anelace	Axial		
22	7/8" With Slotting Device	Facing				
27	7/8"-1 1/16"	Fact	Anent	Axillary		
27	7/8"-1 1/16" With Slotting Device	Factus				
31	7/8"-1 1/4"	Factik		Aximite		
31	7/8"-1 1/4" With Slotting Device	Factiker				
35	7/8"-1 3/8"	Fachey		Axiom		
35	7/8"-1 3/8" With Slotting Device	Facheyer				
31	1 1/4"	Faction	Artemus	Axline		
31	1 1/4" With Slotting Device	Factor				
35	1 1/4"-1 3/8"	Factional	Artesion	Axis		
35	1 1/4"-1 3/8" With Slotting Device	Faiting				
38	1 1/4"-1 1/2"	Faintless	Artfull	Axlis		
31	1 1/4" 18" Stock Feed		Ample			
50	2"	Factual	Artless	Axle		
63	2"-2 1/2"	Fain	Artlessly	Alexis		
70	2"-2 3/4"	Fairy				
50	2" 18" Stock Feed		Amply			
57	2 1/4"	Factum				
70	2 1/4"-2 3/4"	Fadger				
82	2 1/4"-3 1/4"	Fadlip				
70	2 3/4"	Fade				
82	2 3/4"-3 1/4"	Faded				
95	2 3/4"-3 3/4"	Fadedly				
102	2 3/4"-4"	Famous				
102	4"				Habit	
108	4 1/4"	Fadge			Heavy	
140	5 1/2"	Fanatic			Honest	
171	6 3/4"	Fanglite				
197	7 3/4"	Fangless				
	Wet Tool Grinder					Wetgrind

MODEL G

	Standard Equipment	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	Double Cross Slide	Single Slides	Double Cross Slide	Double Cross Slide	Double Cross Slide	Double Cross Slide	Double Cross Slide
	Oil Feed	Oil Feed	Oil Feed	Oil Feed	Oil Feed	Oil Feed	Oil Feed
	Ind. Cutoff		Ind. Cutoff	Ind. Cutoff	Ind. Cutoff	Ind. Cutoff	Ind. Cutoff
	One Set Cams	One Set Cams	One Set Cams	One Set Cams	One Set Cams	One Set Cams	One Set Cams
			Slotting Att.		Slotting Att.		Slotting Att.
			Conveyor		Conveyor		Conveyor
				Shaving Att.	Shaving Att.		Shaving Att.
				Shaving Tool	Shaving Tool		Shaving Tool
				Spec. Spindle Head	Spec. Spindle Head		Spec. Spindle Head
						High Speed Drill Att.	High Speed Drill Att.

Size	Code	Code	Code	Code	Code	Code	Code
3/8"	Phillips	Cowdrey	Burgess	Blundell	Rich	Boesel	Freeman
3/8"–1/2"	Euclid	Superior	Ontario	Woodland	Madison	Scovill	Doan
5/8"	Texas	Georgia	Maine	Colorado	Virginia	Montana	Kansas
5/8"–7/8"	Austin	Atlanta	Augusta	Denver	Richmond	Helena	Topeka

Code Words for High Speed Drilling Attachment

M-M	Machine Sizes	High Speed Drilling Attachment			
		Model A	Model B	Model C	Model H
10	3/8″	Gab	Gaiter		
12	3/8″–1/2″	Gab	Gaiter		
16	3/8″–5/8″	Gab	Gaiter		
16	5/8″	Gaban	Gale		
19	5/8″–3/4″	Gaban	Gale		
22	5/8″–7/8″	Gaban	Gale		
22	7/8″	Gable		Gaudy	
27	7/8″–1 1/16″	Gable		Gaudy	
31	7/8″–1 1/4″	Gable		Gaudy	
31	1 1/4″	Gablet	Galenic	Gauge	
35	1 1/4″–1 3/8″	Gablet	Galenic	Gauge	
38	1 1/4″–1 1/2″	Gablet	Galenic	Gauge	
31	1 1/4″ 18″ Feed		Galatea		
50	2″	Gablet	Galenic	Gauger	
63	2″–2 1/2″	Gablet	Galenic	Gauger	
70	2″–2 3/4″	Gablet			
50	2″ 18″ Feed		Galatea		
57	2 1/4″	Gaff			
70	2 1/4″–2 3/4″	Gaff			
82	2 1/4″–3 1/4″	Gaff			
70	2 3/4″	Gage			
82	2 3/4″–3 1/4″	Gage			
95	2 3/4″–3 3/4″	Gage			
102	2 3/4″–4″	Gage			
102	4″				Ash
108	4 1/4″	Gainer			Maple
140	5 1/2″	Gainer			Pine
171	6 3/4″	Gaimit			
197	7 3/4″	Gaimit			

Model G Attachments are Coded in Combinations. See Machine Code List, Page 278.

Code Words for Double Cross Slide Attachment

M-M	Machine Sizes	Double Cross Slides			
		Model A	Model B	Model C	Model H
10	3/8″	Cab	Cabrit		
12	3/8″–1/2″	Cab	Cabrit		
16	3/8″–5/8″	Cab	Cabrit		
16	5/8″	Cabal	Caburn		
19	5/8″–3/4″	Cabal	Caburn		
22	5/8″–7/8″	Cabal	Caburn		
22	7/8″	Cabalist		Cactus	
27	7/8″–1 1/16″	Cabalist		Cactus	
31	7/8″–1 1/4″	Cabalist		Cactus	
31	1 1/4″	Cabalize	Cacolet	Caddies	
35	1 1/4″–1 3/8″	Cabalize	Cacolet	Caddies	
38	1 1/4″–1 1/2″	Cabalize	Cacolet	Caddies	
31	1 1/4″ 18″ Feed		Cackle		
50	2″	Cabas	Cacolet	Caddy	
50	2″ 18″ Feed		Cackle		
63	2″–2 1/2″	Cabas	Cacolet	Caddy	
70	2″–2 3/4″	Cabas			
57	2 1/4″	Cabler			
70	2 1/4″–2 3/4″	Cabler			
82	2 1/4″–3 1/4″	Cabler			
70	2 3/4″	Cabin			
82	2 3/4″–3 1/4″	Cabin			
95	2 3/4″–3 3/4″	Cabin			
102	2 3/4″–4″	Cabin			
102	4″				Redgum
108	4 1/4″	Cabinal			Poplar
140	5 1/2″	Cabinal			Birch

Model G Attachments are Coded in Combinations. See Machine Code List, Page 278

Code Words for Magazine Attachment

M-M	Machine Sizes	Rotary Tilting Style Model A	Vertical Style Model B	Rotary Tilting Style Model C
10	3/8″		Lake	
12	3/8″–1/2″		Lake	
16	5/8″	Label	Lance	
22	5/8″–7/8″	Label	Lance	
22	7/8″	Labile		Lackey
31	7/8″–1 1/4″	Labile		Lackey
31	1 1/4″	Labium	Ledger	Lactate
31	1 1/4″ 18″ Feed		Lodge	
38	1 1/4″–1 1/2″	Labium	Ledger	Lactate
50	2″	Labros	Lofty	Lactide
50	2″ 18″ Feed		Luster	
63	2″–2 1/2″	Labros	Lofty	Lactide
70	2″–2 3/4″	Labros		

Code Words for Third Speed Attachment

M-M	Machine Sizes	Model A	Model B	Model C
10	3/8″			
12	3/8″–1/2″			
16	3/8″–5/8″			
16	5/8″	Oak	Oasus	
19	5/8″–3/4″	Oak	Oasus	
22	5/8″–7/8″	Oak	Oasus	
22	7/8″	Oaken		Oastey
27	7/8″–1 1/16″	Oaken		Oastey
31	7/8″–1 1/4″	Oakland		Oastile
35	7/8″–1 3/8″	Oakland		Oastile
31	1 1/4″	Oakling	Obduce	Oastus
35	1 1/4″–1 3/8″	Oakling	Obduce	Oastus
38	1 1/4″–1 1/2″	Oakpin	Obdate	Oastave
31	1 1/4″ 18″ Feed		Obduce	
50	2″	Oakum	Obduction	Oastling
63	2″–2 1/2″	Oakum	Obduction	Oastling
70	2″–2 3/4″	Oaky		
50	2″ 18″ Feed		Obduction	
57	2 1/4″	Oar		
70	2 1/4″–2 3/4″	Oared		
82	2 1/4″–3 1/4″	Oared		
70	2 3/4″	Oast		
82	2 3/4″–3 1/4″	Oastab		
95	2 3/4″–3 3/4″	Oasteck		
102	2 3/4″–4″	Oastcey		
108	4 1/4″	Oaster		
140	5 1/2″	Oastdie		
171	6 3/4″	Oasteral		
197	7 3/4″	Oasteral		

TOOLS AND ATTACHMENTS
CODE WORDS

Symbol	NAME	Code	Machine Sizes	Code Affix
K–1	Box Mill, Shoulder, Three Tool	Athol	3/8″	ny
K–2	Box Mill, Fin. for Shaving	Boston	3/8″– 1/2″	ill
K–3	Box Mill, New Model, One Tool	Easton	3/8″– 5/8″	pa
K–4	Box Mill, Old Model, One Tool	Lowell	5/8″	mo
K–5	Bushing for Box Mills for K-4, 30 or 32	Newton	5/8″– 3/4″	fla
K–6	Box Mill, Cupping	Lynn	5/8″– 7/8″	ohi
K–7	Tap and Die Holder, Combination	Corry	7/8″	md
K–8	Button Die Holder (Made to Specifications)	Darby	7/8″–1 1/4″	kan
K–9	Drill Chuck	Dubois	1 1/4″	me
K–10	Drill Holder, Centering	Etna	1 1/4″–1 1/2″	cal
K–13	Reamer Holder	York	2″	wis
K–14	Hollow Mill Holder (Made to Specifications)	Albany	2 ″–2 1/2″	nj
K–15	Threading Die, Spring (Made to Specifications)	Yazoo	2 ″–2 3/4″	la
K–16	Round Chucks, Solid	Geneva	2 1/4″	nd
K–16	Hexagon or Square Chuck, Solid	Ilion	2 1/4″–2 3/4″	vir
K–17	Round Feed Shell, Solid	Hudson	2 1/4″–3 1/4″	ind
K–17	Hexagon or Square Feed Shell, Solid	Ithaca	2 3/4″	ri
K–18	Chuck Blanks for Pads	Malone	2 3/4″–3 1/4″	ky
K–19	Chuck Pads for Round Stock	Newark	2 3/4″–3 3/4″	ore
K–19	Chuck Pads for Hexagon and Square Stock	Oneida	2 3/4″–4 ″	ga
K–20	Feed Shell Blanks for Pads	Medina	4″	ct
K–21	Feed Shell Pads for Round Stock	Olean	4 1/4″	ala
K–21	Feed Shell Pads for Hexagon or Square Stock	Rome	5 1/2″	ut
K–22	Hollow Mill, Straight (Made to Specifications)	Webb	6 3/4″	neb
K–23	Knurling Tool, Straddle, without Knurls	Alpena	7 3/4″	tex
K–24	Knurling Tool, Adjustable with Post	Lorain		
K–25	Drill Chuck Collet	Erie		
K–26	Center Drills	Adrian		
K–27	Knurls, per Pair (Coarse Straight)	Laurel		
K–27	Knurls, per Pair (Coarse Diamond)	Seneca		
K–27	Knurls, per Pair (Medium Straight)	Utica		
K–27	Knurls, per Pair (Medium Diamond)	Adams		
K–27	Knurls, per Pair (Fine Straight)	Ware		
K–27	Knurls, per Pair (Fine Diamond)	Elkton	Spindle Drive	Code
K–28	Gauge Stop, Adjustable	Flint		
K–29	Circular Cut-off Tool (Carbon)	Lisbon		
K–30	Box Mill, Two Tool	Milton	No. 1	Hay
K–31	Double Ratchet Tool Post, Complete	Canton	No. 2	Straw
K–32	Box Mill and Guide for Taper or Irregular Forms (Made to Specifications)	Natick	No. 4	Wheat
K–33	Counterbore Holder	Tyrone	No. 5	Oats
K–34	Conveyor for Slotting, Plain	Auburn	No. 8	Rye
K–35	Hollow Mill, Spiral (Made to Specifications)	Omaha	No. 9	Gin
K–36	Bushing for Slotting Conveyor (Made to Specifications)	Cohoes	No. 10	Flax
K–37	Inside Forming Tool	Monroe		
K–38	Die Closing for Model A	Nutley		
K–39	Roller Steady Rest	Ionia		
K–40	Turning Tool, Overhanging	Orange		
K–41	Turning Tool, Overhanging, with Detachable Arm	Palmer		
K–42	Overhanging Turning Attachment, Roughing or Finishing, with Single or Multiple Cutters	Revere		
K–43	Circular Cut-off Tool (H. S. S.)	Dayton		
K–44	Conveyor for Slotting, Special (Made to Specifications)	Elmira		
K–46	Draw Collets for Special Conveyor, K–44	Fulton		
K–47	Ratchet for Tool Post	Akron		
K–48	Ratchet Tool Post, Complete	Athens		
K–49	Single High Speed Drilling, Model A (See Page 279)	.....		
K–50	Double High Speed Drilling, Model A (See Page 279)	.....		

To indicate machine size use code affix.

Example: Athol—K–1 Box Mill, affix ny, Atholny—K–1 Box Mill for 3/8-In. machine. Substitute affix wis, Atholwis—K–1 Box Mill for 2-In. machine.

TOOLS AND ATTACHMENTS
CODE WORDS

Symbol	NAME	Code	Machine Sizes	Code Affix
K–53	Oil Feed Through Turret	Oil	3/8"	ny
K–54	Oil Feed, Model B	Oilb	3/8"– 1/2"	ill
K–55	Drilling and Reaming Turret Shafts for High Speed Drilling	Nashua	3/8"–5/8"	pa
K–56	Bell and Stop Motion	Camden	5/8"	mo
K–57	Double Cross Slide (See Page 280)	.....	5/8"– 3/4"	fla
K–61	Cross Slide Centering, Facing or Counterboring for Plain Machine (Made to Specifications)	Minot	5/8"– 7/8"	ohi
			7/8"	md
K–62	Single Cross Slide Tapping with Tap Holder Combination for Plain Machine (Made to Specifications)	Salina	7/8"–1 1/4"	kan
			1 1/4"	me
K–63	Double Cross Slide Tapping, Centering or Counterboring with Tap Holder Combination for Plain Machine (Made to Specifications)	Brewer	1 1/4"–1 1/2"	cal
			2"	wis
K–65	Sliding Head Recessing Tool Holder	Reno	2 "–2 1/2"	nj
K–66	Vertical Magazine for Model B (See Page 281)	.....	2 "–2 3/4"	la
K–68	Third Spindle Speed with New Machine (See Page 281)	.....	2 1/4"	nd
K–70	Thread Rolling Attachment	Dothan	2 1/4"–2 3/4"	vir
K–71	Independent Cut-off Attachment	Mobile	2 1/4"–3 1/4"	ind
K–72	Double Camming for Stock Feed	Xenia	2 3/4"	ri
K–73	Double Belt Shifter Dogs	Ashley	2 3/4"–3 1/4"	ky
K–74	Double Camming, Complete	Butler	2 3/4"–3 3/4"	ore
K–75	Boring Tool, Adjustable	Owosso	2 3/4"–4 "	ga
K–77	Cross Slide Taper Turning	Globe	4"	ct
K–79	High Speed Drilling, Model B (See Page 279)	.....	4 1/4"	ala
K–80	Die Closing for Model B	Rahway	5 1/2"	ut
K–82	Box Mill, with Side Cutting Tool and Adjustable Roller Rests (Made to Specifications)	.....	6 3/4"	neb
			7 3/4"	tex
K–85	Flat Forming Tool and Post (Width of Tool Required)	Derry		
K–86	Threading Die, Button (Made to Specifications)	Joplin		
K–88	Slotting Attachment (With Machine)	.....		
K–89	Drill Holder for High Speed Drilling Attachment	Rankin		
K–90	Box Mill, Two Tool, for Finishing or Shaving	Sangus		
K–93	Split Drill Holder, for Straight Shank Drills	Kane		
K–94	Straight Cut-off Tool and Post, Front	Elyria		
K–96	Extra H. S. S. Blades	Urbana		
K–97	Rotary Tilting Magazine	Warren		
K–99	Openside Tool Posts for Square or Forming Cutters	Niles	Spindle Drive	Code
K–100	Universal Cut-off Tool, without Post	Piqua		
K–101	Universal Cut-off Tool, with Post	Sidney	No. 1	Hay
K–102	Multiple Cut-off Post with 4 Blades (Made to Specifications)	Galion	No. 2	Straw
K–103	Multiple Cut-off Post with 6 Blades (Made to Specifications)	Kenton	No. 4	Wheat
K–104	Extra Spacing Blocks for K–102 and K–103, per Pair (Made to Specifications)	Lima	No. 5	Oats
			No. 8	Rye
K–105	Turning Tool, Overhanging, to Break Corners or Remove Scale for Turret Tool Holders	Quincy	No. 9	Gin
K–106	Cutter Head for K–42 (Made to Specifications)	Berea	No. 10	Flax
K–107	Tool Posts for Milling Slide, Model B	Tiffin		
K–108	Roller Steady Rests for Milling Slide, Model B	Troy		
K–109	Thread Roll Holder for Independent Cut-off Attachment	Selma		
K–110	Cut-off Tool Holder for Independent Cut-off Attachment	Bisbee		
K–111	Conveyor for Slotting, Model G	Dover		
K–112	Double Cutter Block for 18-in. Feed, Model B Machine	Summit		
K–113	Single Cutter Block for 18-in. Feed, Model B Machine	Union		
K–114	Double Heavy Type Roller Rest for Milling Slide for 18-in. Feed, Model B Machine	Albion		
K–115	Single Roller Rest for Milling Slide for 18-in. Feed, Model B Machine	Saco		
K–116	Necking Attachment and Post, 1 Cutter	Eureka		

To indicate machine size use code affix.

Example: Athol—K–1 Box Mill, affix ny, Atholny—K–1 Box Mill for 3/8-In. machine. Substitute affix wis, Atholwis—K–1 Box Mill for 2-In. machine.

Code Words for Numbers or Fractions

Even Number	Fractions							
0–act	1/64 ka	9/64 li	17/64 mq	25/64 yb	33/64 bg	41/64 co	49/64 dw	57/64 ef
1–boa	1/32 kb	5/32 lj	9/32 mr	13/32 zc	17/32 bh	21/32 cp	25/32 dx	29/32 eg
2–cry	3/64 kc	11/64 lk	19/64 ms	27/64 ab	35/64 bi	43/64 cq	51/64 dy	59/64 eh
3–day	1/16 kd	3/16 ll	5/16 mt	7/16 ac	9/16 bj	11/16 cr	13/16 dz	15/16 ei
4–ere	5/64 ke	13/64 lm	21/64 mu	29/64 ad	37/64 bk	45/64 cs	53/64 da	61/64 ej
5–fat	3/32 kf	7/32 ln	11/32 mv	15/32 ae	19/32 bl	23/32 ce	27/32 db	31/32 ek
6–gag	7/64 kg	15/64 lo	23/64 mw	31/64 ag	39/64 bm	47/64 cu	55/64 dc	63/64 el
7–hub	1/8 lh	1/4 mp	3/8 xa	1/2 bf	5/8 cn	3/4 dv	7/8 ed	
8–ink								
9–jug								

Example of Code Combination 15¾:

boa—1 fat—5 dv—¾ Code, "boafatdv."

To be used in specifying stock diameters, size of holes, shank diameters, milling lengths, serial numbers, or quantities, etc.

Specification Codes

BUSHING:
Size of Hole ..... *Carrot*

CASTINGS:
Cored Holes ..... *Borax*
Holes not Cored ..... *Squint*

CROSS SLIDES:
Front of Slide ..... *Front*
Rear of Slide ..... *Rear*

DIAMETERS:
Finished ..... *Part*
Outside Shaved ..... *Rent*
Outside not Shaved ..... *Quire*
Shank ..... *Pepper*
Stock ..... *Cres*

HOLES:
Drilled ..... *Quart*
Reamed ..... *Gallon*
Bored and Reamed ..... *Pint*
Length to be Milled ..... *Grant*

LINE SHAFT:
Size and Speed ..... *Beat*

MATERIAL:
Kind of Material ..... *Note*

SERIAL NUMBER OF MACHINE ..... *Alloy*

SPINDLE:
Forward ..... *Stand*
Reverse ..... *Cram*

THREADING:
External ..... *Array*
Internal ..... *Index*
Pitch of Thread ..... *Main*

STYLE OF SCREW THREADS:
U. S. Standard ..... *Cause*
V-Threads ..... *Pore*
Whitworth Standard ..... *Clam*
British Association Standard ..... *Arab*
French (Metric) Standard ..... *Sent*
International Standard ..... *Parent*
German Loewenherz Standard ..... *Forge*
Rolled Threads ..... *Rod*
Acme 29 Deg. Standard ..... *Lap*
Acme 29 Deg. Tap Threads ..... *Subway*

TOLERANCES ALLOWED ..... *Clef*

To be used in specifying any information necessary in combination with the numerical codes, page 284, and tool and attachment codes, pages 282 and 283, to make up a message.

"Cleveland"